defense management JOURNAL

Streamlining the RFP

January 1973

defense management JOURNAL

Vol. 9, No. 1 January 1973

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Contributing artists for this issue are: Alex Della-Valle, Mary L. Field, Orville O. Tonoda.

Comment

by Admiral Thomas H. Moorer, USN
Chairman
Joint Chiefs of Staff

As we begin a new year and move on through the 1970s, the prospects for an enduring peace are more encouraging than at any time in our generation.

This promising outlook is substantiated by the dramatic and meaningful achievements gained recently through our Government's negotiations on problems ranging from the long and frustrating conflict in Indochina to the search for a solution to the issues that have for so long been a source of confrontation between ourselves and the Soviet Union. The American people, and indeed the peoples of the world, have good reason to view the future with hope.

It is essential, however, that buoyed by such hope we approach 1973, and especially the remainder of this decade, mindful that in order to sustain the momentum of our negotiating efforts the United States must remain strong. We, as a nation, must guard against a euphoric over-reaction, so often a partner to relaxed international tensions, which could result in debilitating reductions in our defenses.

You can be sure that there will be many articulate advocates who will volunteer persuasive arguments in behalf of significant cutbacks as a "peace dividend." But the viability of our future foreign policy initiatives, and the momentum of which I spoke on the negotiating track, depend on our maintaining strong military deterrent forces.

We must, however, focus on today's realities and acknowledge that there are strong and legitimate domestic and social needs in our country which require attention and resources. These, you may be sure, will be attended to by our President and our Congress with particular zeal and dedication. This will necessarily place the Department of Defense squarely into the position of having to use our manpower and other resources as effectively, efficiently and economically as possible.

If we don't and if inadequate use of our assets occurs, then, in the budgetary climate we must expect, we can unhappily reap the consequences of weaker armed forces, a diminishment of our deterrent credibility and vitiation of our negotiating position.

I am confident this will not be the case. Throughout all the years of my life and especially during my naval career, I have seen Americans, in and out of uniform, take on any real challenge and get the job done. Our only drawback is that sometimes it takes Americans a little longer to recognize what the challenge is.

You and I share an immediate and long range challenge. Simply stated, it's our job to do everything we can to get the utmost out of what is given us for the defense of our great Nation and the American people.

Defense Logistics: Challenge of the 1970s

Continued Effort Needed To Capitalize on Past Achievements

During the past four years in the logistics area some very sound policies have been enunciated and a number of programs have been set in motion. Without question, much remains to be done. The challenge for the next four years, and the remainder of this decade, is to continue this progress and to direct our attention to the effective execution of those policies which we already have.

A number of policies and new directions have been introduced in the defense weapon systems acquisition area dealing with development and production; life-cycle costing; prototyping versus paper competition; program management, including training and continuity; the Defense Systems Acquisition Review Council; milestones; fly before you buy; testing prior to the production decision; etc. The basic acquisition policy is contained in DOD Directive 5000.1. Execution of that policy is of crucial importance as we are now in a position either to continue to provide our forces with the equipment they need or to price ourselves right out of the market.

by Barry J. Shillito
Assistant Secretary of Defense (Installations and Logistics)

Let's look at a few facts. Nearly 60 percent of the DOD budget is now spent for people-related items such as salaries and retirements. Moreover, DOD has felt the bite of inflation. In terms of real money, the DOD budget has actually *declined* $16 billion between FY 1968 and FY 1973. Recent cost growths are such that if these rates are extrapolated, in a very few years the Air Force will be able to afford one plane, the Navy one ship, and the Army one tank.

As a businessman, I think of the Soviet Union as our competition and in acquainting myself with their system I learned that:

- The USSR, on individual weapons, is not acquiring more for less expenditure of resources. We are much more efficient in our use of men and equipment.
- In comparing individual USSR weapons with U.S. weapons, our weapons are more capable, particularly in multi-mission roles.

• U.S. weapons are more costly because of their sophistication at the expense of U.S. force size.

The national USSR policy appears to be a systematic increase in resources devoted to the military establishment and the defense related industries, the creation of an industrial base to develop and produce increasingly capable weapon systems, and a dramatic increase in quality and quantity of the USSR capability as reflected by their defense industry trends.

Defense Systems Acquisition

We must continue to improve our acquisition procedures if we are to obtain defense weapons that are economically and operationally competitive with those produced in the USSR—and if we are to have a force size that presents a realistic deterrent. Therefore, I believe it will be useful to repeat a few points that I have made on many previous occasions.

• *Defense Systems Operational Requirements.*

We have to make a sharp distinction between defense weaponry that is really needed and weaponry that might be "nice to have." Stating such a goal may sound so very obvious. Achieving it, however, will require objectivity and self discipline of the highest order. It will also require a clear idea of our force objectives.

• *Controlling Innovation and Sophistication.*

When a requirement for a particular defense weapon system is objectively substantiated, the question arises: How can this need be satisfied as economically as possible? Controlling sophistication must be accomplished very early in the life-cycle process, preferably by an organized adverse review of each weapon within our individual Military Services. This is often hard to accomplish in the Services but I believe it must be done. We cannot afford unnecessary features in each and every weapon. We have to decide early and surgically whether or not there is a real need for such things as a terrain following radar or a very sophisticated and costly gun mounting. There is need for a greater awareness that post-contract design changes must tie to a dollar availability decision.

• *Cost Consideration in Design.*

Having decided on design essentials, we must ensure that the designer is aware of unit production costs and costs of using the weapon before the production decision is made. We must do this by setting a target for the production cost and measuring progress to that target during design. To set the target, we will have to decide how many units we will need to buy and what total cost we can afford. After this decision, the next step is to incorporate these requirements in the contract in enforceable terms. Of course, we must know what cost is reasonable to expect for the performance we ask.

Next, both DOD and industry must arrange for feedback from producers to designers and to the contractor and DOD managers. In this way we can trade off design against cost when necessary. Design to cost and cost-to-produce are really part of a higher order which can be called "produce to cost." But this cannot leave out the other cost area—"cost to produce." Awareness of reliability, maintainability, and life-cycle cost must be an integral part of the design effort and the unit cost-to-produce target.

Parenthetically let me emphasize that the concepts of "design and produce to cost" should not be confused with total package procurement. Total package procurement required one decision to develop and produce specified numbers of a system to specified performance, cost and time limits. In contrast, DOD policies emphasize incremental acquisition and early flexibility in design specifications. We first build up experience through tradeoffs and feasibility work; then we award cost reimbursable development contracts with incentives; and finally we may have a competitive prototype "fly-off." These efforts precede a production decision. At each step we minimize the risk to both the supplier and the Government and we establish confidence before moving ahead.

• *Independent Subsystem Development.*

We must do more to encourage subsystem development independently of system acquisition. To me, this is one of the most important areas warranting attention. This is a practice which the Soviets religiously pursue and which the European aircraft developers use to good advantage. The fundamental development strategy used most widely in Europe calls for no substantial commitment to be made until the basic development process has been completed and proof of utility demonstrated by performance tests. This strategy is characterized by a

pronounced reliance on early proof testing of engines, electronics equipment, airframes, etc. Production commitments ordinarily are delayed until both the performance and the probable durability of the appropriate subsystems have been adequately demonstrated. Progress in aircraft development proceeds on an incremental subsystem improvement basis.

DOD must provide an environment in which the system designers or developers have substantial freedom to select from a "stable" of tested and proven subsystems those items which can be incorporated into their system during the various stages of development. In most cases, system developers may, indeed, be looking for a subsystem development to improve the performance of their system. The evolutionary development of selective independent subsystems can bring about significant cost decreases not only in the production of the total defense system but, possibly more important, in the support of the system in its downstream stages of production and in the cost of ownership. We need a constant flow of complex subsystems coming along that are tied to anticipated future weapons needs.

- *Net Technical Assessment.*

There is the need to move ahead rapidly on our capabilities to improve our net technical assessment competence, *i.e.*, our ability to assess the relative strengths and weaknesses of U.S. and Soviet forces. Such assessments help identify U.S. deficiencies and determine the adequacy of steps being taken to eliminate them. This, in turn, relates directly to the weapons we must have. It is especially important in view of SALT and Mutual Balanced Force Reduction negotiations.

- *Testing.*

Within the last year we formalized our testing procedures to give greater emphasis to hardware tests and test results, particularly independent operational testing of weapons systems. But a "go/no go" evaluation of a weapon system is not enough. Each subsystem must be thoroughly tested early in its development cycle before it is interfaced with other subsystems to comprise a complete defense system.

We must evaluate not only the weapon and its components, but also its support equipment as early as possible in the development effort. It is worth the time to test early rather than spending more time and much more money to change a design and rebuild a system which turns out to be deficient after delivery. On most weapons the cost of changes goes up exponentially as they move from the design phase to production.

- *Life-Cycle Costing.*

The concept of life-cycle costing has been used within DOD for some years. Some progress has been made, but much remains to be done. We are beginning to include life-cycle costing requirements in the Development Concept Paper on our major defense systems. It is also becoming a part of the decision-recommending process of the Defense Systems Acquisition Review Council (DSARC).

At the same time, we very much need to improve our ability to quantitatively predict more life-cycle costs or "cost of ownership." This is particularly true in our weapons selection decision. We must improve our ability to predict the costs of such things as corrective and preventive maintenance, inventory management, maintenance and operational training, inspection and installations checkout and, in general, the cost of operating the weapon once it is in inventory. This is a very tough job.

Any action in this area, even depending upon the best judgments of the most knowledgeable persons in their specific areas of expertise, is better than ignoring this important segment of the total cost of a system. This effort is directly tied to cost-to-produce as well as total ownership cost. This implies, of course, that we must have sufficient flexibility to change our cost-to-produce if significant savings or improvement can be realized in the cost of ownership.

- *Program Manager Continuity.*

Significant strides have been made in recent years in assuring better continuity for our program managers. I do not believe, however, that we have gone far enough. We are convinced that one way to increase management efficiency is to give the program manager as much authority and responsibility as we can so that he can, in fact, manage his program. We also must ensure that our Services' career development patterns tie to this need for increased continuity.

Communication of Policy

There is a definite relationship between an organization's size and the number and kinds of policy changes or major procedural changes it can absorb over time. Size is also a factor in terms of the length of time it takes an organization to respond to policy or method change or to absorb change. The size alone of DOD limits the number of major policy changes it can effectively absorb. An essential point is that changes must be sound, few in number and provide a continual flow of communication. We have tried the past four years to recognize these facts of life in every way. As a result, there is more vertical and horizontal communication throughout DOD than has ever been the case in its history. I think the success we have all had working together is exceptional.

Several ongoing efforts that are being used to communicate policy guidance, particularly in the systems acquisition area, are:

• *The Joint Logistics Commanders.* The Chief of Naval Material, and the Commanders of the Army Materiel Command, the Air Force Logistics Command and the Air Force Systems Command meet regularly. This group has undertaken a number of very useful studies and meets almost every month with the Deputy Secretary of Defense, the Director of Defense Research and Engineering and the Assistant Secretary of Defense (Installations and Logistics) to review progress and offer advice. In addition, about every six months this group meets with the Logistics Systems Policy Committee.

• *Logistics System Policy Committee (LSPC).* The LSPC, which includes the senior logisticians of DOD, meets monthly with the Assistant Secretaries of Defense (Comptroller) and (Installations and Logistics). Already a logistics plan (LOGPLAN)—the blueprint for logistics progress through 1980—has been developed and approved. The LOGPLAN consists of some 200 logistics elements and is the first document ever to establish a wide range of common goals for all Military Services and the Defense Supply Agency. A number of LSPC studies have been completed and, among other things, have led to improvements in supply system item management and the integrated management of petroleum and property disposal activities under the Defense Supply Agency.

• *Senior Service Management.* The key civilian and military officials in each of the Military Services have been meeting regularly to identify their own defense systems acquisition and logistics problems and then take steps to resolve them.

• *Quality Assurance Council.* This council was recently established to find ways to improve, on a cost-effective basis, the quality and reliability of items purchased by DOD.

• *Maintenance Steering Group.* Our annual maintenance costs are in the neighborhood of $20 billion. This group, which is composed of senior military service personnel, meets monthly to consider ways of improving this very important and very expensive element of logistics.

• *Training.* To get anything done at all you have to get down to where the action is. In the final analysis, implementation of policy is what goes on at the field operating level. Because of this we recognize the importance of training and have a number of educational programs underway. Most of these programs consist of briefings, lectures, films, etc., on the implementation of specific policies *e.g.,* uniform cost accounting standards, contractor overhead negotiations. In addition, formalized career development programs in quality and reliability assurance and procurement have been established.

Contracting

The challenge to our procurement people is to develop the kind of contractual incentives that will ensure the desired motivations on the part of contractors, particularly as we implement the "design to a life-cycle cost" approach. Sufficient contracting arrangements are not yet in existence to reward contractors who give DOD quality, on-time deliveries and reasonable costs. Existing weighted guidelines are heavily tied to estimated costs before contractors begin work. A greater degree of profit determination must be made after completion of a portion of the contract in order to reward the efficient and penalize the inefficient.

Since FY 1969 there has been a noticeable shift between fixed price and cost plus type con-

tracts in our negotiated procurements. In fact, the FY 1969 split was 74.8 percent fixed price and 25.2 percent cost plus type. In FY 1972, fixed price contracts had declined to 49.1 percent, while cost plus contracts accounted for 50.9 percent. I believe that a much greater percentage of our cost plus type developmental contracts for major weapons should be on an award fee basis—after segments of the work has been completed. This forces the contractor and the Government to assess the situation and make very tough progress decisions leading to the award of profits after the fact. This approach can and should tie directly to the proper motivation for designing to a life-cycle cost.

Productivity

The purpose of improving and measuring productivity in DOD is to increase efficiency by either reducing the total cost of a given level of output or by increasing the output with the given level of resource cost. Indeed, it is mandatory that we offset personnel and unit cost increases to the maximum practicable extent by increases in productivity. This can occur by a combination of efforts, but most often by an increase in labor productivity or through technological advances as a result of capital investments.

The Defense Integrated Management Engineering System (DIMES) was strengthened and reissued this past year. Its objectives now are to improve labor productivity through the application of management engineering principles and techniques; and to provide a common base of work measurement and productivity data which can be used in the development of budget estimates and manpower requirements, in work planning and control, and in the development of productivity performance indices.

DIMES is the primary labor productivity improvement system and the principal work measurement system presently in use in DOD. Increased attention by mid and top level

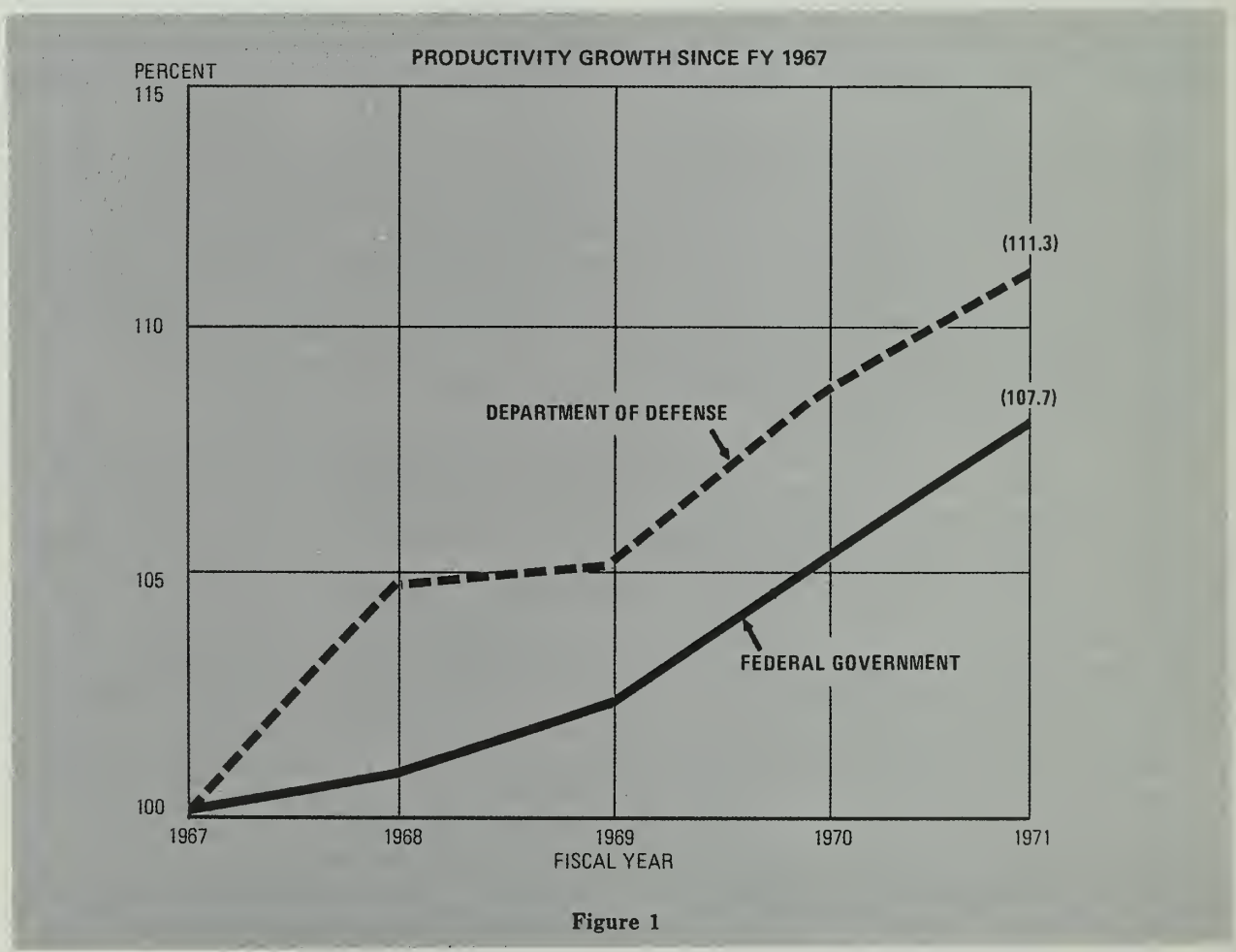


Figure 1

managers to the system will help assure continued improvements in labor productivity. Another major ongoing effort is the joint project concerning measuring and enhancing productivity in the Federal sector conducted by the Office of Management and Budget, the Civil Service Commission and the General Accounting Office.* This group is exploring many elements which affect or may have an effect on productivity. Also for the first time in history a productivity index for the Federal sector has been developed and published. The relationship of the Federal productivity index to DOD for the period FY 1968 to FY 1971 is shown in Figure 1.

Secretary of Defense Melvin Laird recently stated, "Defense components are acutely aware of the need to improve productivity both in our inhouse activities and in defense related industries." This awareness becomes the challenge for the future.

Automation

We should all be aware of what is happening in DOD logistics as far as automation is concerned. The Military Standard Systems are developing all around us:

- Military Supply and Transportation Evaluation Procedures (MILSTEP).
- Military Standard Contract Administration Procedures (MILSCAP).
- Military Standard Requisitioning and Issue Procedures (MILSTRIP).
- Military Standard Transaction Reporting and Accounting Procedures (MILSTRAP).
- Military Standard Transportation and Movement Procedures (MILSTAMP).
- Uniform Materiel Movement and Issue Priority System (UMMIPS).

We are on the verge of embarking on MILSCAP—the automated Military Standard Contract Administration Procedure. It is a major effort which goes into effect April 1, 1973. We have slipped its implementation date three times to be sure we have minimal problems.

MILSCAP, although it is quite complex and a major step forward, is relatively simple compared to the Defense Integrated Data System (DIDS) which will be housed at Battle Creek, Mich., as a part of the Defense Logistics Support Center. To my knowledge, it will be the largest single computer installation in the world. It will initially require the storage of 14 billion characters of data and annually process some 60 million transactions. It will serve multiple functions and will provide management information services to not only DOD but also Federal civilian agencies and some friendly foreign governments. It is designed to improve item identification, prevent item proliferation and duplication and materially improve item utilization. It is designed to be of benefit to the industrial sector by improving provisioning through direct computer access. It will include not only manufacturers' part numbers and their screening, but also characteristic screening. It is the intent of this system to significantly improve our standardization system. It is now scheduled for activation in September 1974.

As an interesting sidelight about the Military Standard Systems that we have kicked off is the adoption by IBM of most of the information contained in the Military Standard Systems for its total in-house company management operations. We completely developed the system, sweat most of the blood and, apparently, IBM is now convinced we are on the right track.

I have just skimmed the surface of those items that we can all point to with pride and I have only briefly highlighted some of those areas that warrant a great deal of attention during the next several years. We have sound policies and we have momentum. The many problems that remain can be resolved with the cooperation and the assistance of everyone. I am confident this will be the case. □

* See "Joint Study Shows Productivity Gains" by Thomas D. Morris in the October 1972 *Defense Management Journal*, p. 16.

An Analysis of Frustration: The RFP-Proposal Cycle

The request for proposal, RFP for short, is just that—a request to industry to propose a product or service to a buyer. To the Department of Defense the RFP is a most important document, just as it would be to any organization involved in the acquisition of major, complex products.

Without defending or supporting the existing RFP process, it is appropriate to acknowledge at the start that the RFP carries a sizeable burden in the role of communicating to industry the requirements for a major defense system. We should expect to find a number of problems and issues that are the direct result of the complexity of the task and the pressures that come from numerous and diverse institutional interests involved in the action.

Why do we choose to write this article? Because there is real substance to the topic and much to talk about. If we do no more than collect a few thoughts and air a few frustrations that have been expressed by many over the years, the results will have been worth the labor. But there is a further interest—admittedly, a biased one—and that is to attempt to influence managers to lean on procurement people for more and better management.

by Brig. Gen. A. L. Esposito, USAF
Director for Procurement Policy
OASD (I&L)

A first impression, after some initial poking around in several files and talking to several veterans of the system, was: I can see the smoke but where is the fire? A second impression, after continuing to prod the system for information and ideas, was: Who is steering that log downstream?

These two thoughts tend to paint a picture that is not too inaccurate a characterization of the subject and many of the key issues we may want to associate with the policies, procedures and problems involving RFPs. However, let it be said that any suggestions that these comments may lead to acceptable conclusions, improvements in the process, or resolution of current issues would be presumptive.

The Issue

The RFP is known by some, and assumed by all, in Government and industry to be a problem. Any attempt to be specific in stating the problem *would* be a problem, even though the criticism is extensive. Some generalizations, however, are possible. The problems identified with RFPs appear to grow out of bulk, volume —the shear bigness of the document, the massiveness of the response and the cost in people, time and dollars attributed to the demands of the RFP.

As the basis for this generalization, we must point to the various studies, articles and management actions that have concluded or resulted

in recommendations and attempts to reduce the number of pages in RFPs and in proposals submitted by contractors. Without question, page control mechanically inhibits bigness but the effectiveness of this approach in getting to the smoke is not clear. Nonetheless, the existence of smoke is a fact and, therefore, action to at least control the smoke is required; page control certainly does achieve that end—at least in appearance. There is the danger, however, that we will oversubscribe to the belief the basic issue is bigness and, accepting the page-limiting criteria as a solution, overlook completely the real causes for the RFP problem.

We can summarize the issue of the RFP problem by saying we are not pleased with the efficiency and effectiveness of the process as measured by the effort and resources needed to prepare the RFP and the responses. Neither are we pleased with the results of the process which starts with the RFP. We would add that, while we are certain there is a problem, there is no certainty as to the specific nature of the problem. A further view of the issues, attempting to bring some focus or direction to our search for the source of the problems, would question the RFP process in terms of the:

- Reasonableness of requiring the full scope of program definition.
- Ability of the buyer to anticipate and define the extensive program data requirements adequately.
- Ability of the seller to respond realistically to the request for detailed program requirements.
- Value of the results.

Role of Procurement

Procurement people—I prefer to identify them as the businessmen of the Department of Defense—are the so-called keepers of the keys for the RFP process. These are the people who have the responsibility for the RFP operating function as well as policy and procedures. While procurement people have functional responsibility for RFPs, we need to recognize the RFP is not a procurement document alone. The RFP is a total system program document representing the individual and collective interest of every functional activity participating in the acquisition program.

Notwithstanding the difficulty of the task, the role of procurement in the control of the RFP is a proper one. We should recognize the RFP is the start of a process that has strong business needs, notwithstanding the specific functional interests and demands of the defense system program. We must insist in policy, as well as in the real world day-to-day operating activity, that the RFP is primarily a business action. It is the first attempt to translate a complex, diverse, fragmented and extensive precontract activity into a comprehensive, definitive, well integrated, accurate communication to industry informing various firms exactly what it is the Government wants to buy. The business orientation of the RFP is not good and procurement people need to make the RFP an effective and efficient document which will lead ultimately to a good business arrangement between buyer and seller.

Centralized vs Decentralized Control

There is a natural tendency in any organization with major line and staff elements, structured in several layers between the top levels and the field operating levels, to centralize decisions at the top. Higher-level staffs somewhat removed from the operating detail tend to feel insecure when major management activities are delegated to the lower levels—when the boss asks questions you want to have the answers. Study groups convened to probe problem areas often find it necessary to recommend corrective actions that would raise the review and decision level to the top of the orga-

nization. Seldom is the question asked to differentiate between the operating or doing task versus the policy or controlling activity in recommending functional involvement by line and staff elements.

In digging into the RFP process, as mentioned previously, the steering mechanism or focus is not obvious. It is clear, however, that the RFP is a working document. Operating rules, evolving directly from the Military Services and Defense Agencies, constitute 99 percent of the RFP management process. While there is a check list in the Armed Services Procurement Regulation for inclusion of "applicable and appropriate information" in solicitations, there is little policy as such from the OSD level.

A preliminary judgment at this point could lead to the conclusion that strong central control over the RFP is needed to resolve outstanding issues and tending toward standardized documentation for all procurements. Certainly there are some strong arguments for standardized procedures to provide a focus for improving and simplifying the RFP process. However, if we accept the conclusion that the RFP is a working document that must be precisely tailored to the unique demands of each specific program, an equally biased judgment could be made in support of the existing approach, *i.e.*, leave the preponderence of control at the Service and Agency level and continue to manage the RFP through operating rules and controls.

The "murder board" concept* to test the efficiency and effectiveness of an RFP appears to be an excellent technique. As an approach to control of the RFP, a selective "devil's advocate" or "adversary" review by carefully selected experienced people puts the operating level on notice to do its job well and to view its RFP product critically before subjecting the document to the test. The board should be convened at the lowest practical level but no higher than the head of the procuring activity and, as previously stated, consist of carefully selected experienced people.

An alternate consideration would be for the system program manager to convene a board of "outside experts"—not associated with the program—with the objective to advise him independent of his in-house experts.

Important to the consideration of establishing better control in the RFP process should be the objective of retaining the RFP as a working document, managed by operating people who have been given the responsibility to buy a specific product or service. The initiative must not be taken from the operator. He must be given the incentive to run his shop, to do the job he has been given to do, but to do it right. In this regard the thrust to establish the measure of acceptability and to provide the judgment of acceptability must come from procurement people—the DOD businessmen. Line managers must look to the business function to get the total job done right.

How Much Is Too Much

If we listen well to the critics, the RFP is too big, the industry response is massive and the cost to Government and industry is excessive. Notwithstanding the author or the choice of words, the picture comes through loud and clear—the RFP is too much on both sides of the Government-industry interface.

How much is too much? If you search the past or the present for an answer, you find what may be an answer or at least an implied answer. Everyone seems to agree that "back-in-the-days of the ole bicycle shop and Kitty Hawk" the one-page solicitation was not too much. Certainly with such a standard anything is too much.

The question of adequacy is the key in exercising judgment in this issue. Neither the Government nor industry should expect to enter a dialogue that has the objective of defining the buyer's needs and responding with the sellers' proposals for programs involving the expenditure of multi-billions of dollars over periods of 5 to 10 years and do so in simplistic terms. The issues are complex and it follows that the relationship and the mechanics of the process cannot be simple. Clearly a major part of the problem involving the RFP process is that our concern is expressed in meaningless generalizations and there exists a total lack of judgment, or the basis for a judgment, of the scope and content of an efficient and effective process for

* *See "AFSC Procurement Evaluation Panel: New Check in Defense Systems Acquisition," by Maj. Gen. Edmund F. O'Connor, USAF,* Defense Management Journal, *April 1972, p. 11.*

solicitations. Judgments of adequacy or what is not too much must be business judgments and system program managers should look to the procurement people to exercise this responsibility as a functional activity. Procurement people must see to it that generalizations are displaced by reasoned viewpoints of how much is okay.

Program Definition and the RFP

The RFP triggers a major effort by industry to develop proposals responding to the buyer's stated needs. The pressures of competition are considerable and drive the action hard. In this environment communication is sensitive and all parties must be cautious and alert to ensure they read each other accurately. The burden for carrying the message in this up-tight marketplace falls squarely on the RFP and the procurement people.

As stated before, the RFP attempts to translate extensive preliminary study activity in several functional areas into an effective and binding business arrangement between buyer and seller. The buyer uses the competitive environment of the marketplace in attempting to force complete definition of the program needs and to contract a firm commitment with a seller to deliver the required product. The seller in reacting to the pressures of competition responds with gross optimism and agrees to a success-oriented commitment.

Program definition is the principal result of this interchange between buyer and seller. The RFP is the vehicle to describe the needs of the buyer, the proposal is the vehicle that defines the commitment by the seller, and the contract is the negotiated agreement binding the parties in a final business arrangement.

Good program definition is vital to program success. Poor initial definition will surely lead to failure when judged by the contract terms and conditions.

Good and poor definition cannot be assessed or judged by the extent of commitment forced by the buyer and accepted by the seller. Each can, and most often does, oversubscribe in his task as buyer and seller leading, as experience proves, both parties to unrealistic and impossible demands and commitments. Effective program definition must be viewed in the real world considering the known and unknown elements of the program. There is no issue more critical to the program manager than the acceptance of contract terms and provisions that prove to be insensitive to uncertainty and risk issues. Much of the criticism directed at the RFP is this forcing tendency to commit both Government and industry to success in the face of uncertainty. For example, arguments to drop total package procurement for complex development programs reflect the concerns for premature commitments to uncertainty. There is need to insist the RFP state requirements that reflect the world as it is and not as one might guess it will be or wish it to be.

Again we need to relate to the functional role of the DOD businessman in looking for the man to grab the tiller. System program managers must recognize the task of translating several functional requirements, that might be represented in any program, into a business arrangement in a business function. As managers responsible for the total task, they should lean on the procurement people to see that the job is done right. The business heads must accept the task of judging the balance of the Government's demands in terms of reasonableness as viewed from marketplace situations and the ability of industry to fulfill the terms and conditions of the contract to be. We may well be talking about a capability that does not presently exist. Most certainly, we are talking about a change in emphasis in the role of procurement people as business managers.

RFP Planning and Doing

A common characteristic of many organizations is the short fuse put on most actions following a decision to do something. It seems that we are determined to have a built-in anxiety generator to keep us moving or strapped to the plow. Invariably the process of preparing the RFP is a crash effort and the task of responding is a mountain mover with all competitors running to get in before the door is shut.

We need to question the timing of the RFP events since there is every reason to believe it is not well founded and that the short fuse typical of the RFP-proposal cycle may well contribute to the problems that are associated with the RFP document. Obviously the tremendous effort needed for the Government to prepare the RFP and for industry to respond to the requirements is time sensitive in terms of any

judgment as to how big is big. If we measure bigness as a function of pages and time, we find that even one page, if ratioed to zero time, appears as infinitely big. The perspective of the quantity of effort and the quality of results, on both sides of the interface, will in great part be determined by the time available to do the job. A good RFP will certainly be judged to be poor if the response time is unrealistically short.

Time is needed to structure an efficient and effective RFP by business-oriented planners and doers. There is no way to take a complex issue, such as a major defense system program, at completion of the conceptual or prototype phases and readily and quickly translate the know-how into an efficient and effective RFP. This early planning and thinking step in the process of getting ready to prepare the RFP is critical to managers for it is at this point where program managers should and must exercise thought, direction and control. The program manager should not allow the RFP to be the vehicle that drives the program into a box with the lid nailed shut.

The RFP should be tailored to the specific program needs, should separate the knowns from the unknowns, and should insist on good definition of the knowns and the identification of and management approach to the unknowns or risk issues. There is a strong viewpoint that suggests we should avoid commitments when dealing with program uncertainty. An opposing viewpoint is to insist on total program definition including good definition for the knowns and good definition of how the unknowns are to be managed. Fiscal planning and budgets should provide firm funding for the known conditions and best estimates plus contingency dollars to cover the unknown areas in terms of the probable alternate courses of action related to the unknowns or risk areas.

The intent of the RFP should stress the objective of obtaining total program definition in the response recognizing that, while the preponderence of a program involves known conditions, there will be unknowns or risk areas that require optional and contingency planning.

The business head is again the responsible person to see that the RFP achieves the objectives of management. Program managers should look to the procurement people to provide the functional expertise necessary to task and guide the organization in producing an RFP that is precisely tuned to the unique demands of the program.

Now What?

What will happen in the future is an obvious and proper question. The answers will come primarily from the operating levels. An example is a quote from Lieutenant General James T. Stewart, USAF, Commander of the Air Force System Command's Aeronautical Systems Division (ASD), "I never cease to be amazed when I read an RFP prepared strictly in accordance with all the ASPR's and AFPI's —I seldom understand completely all of the goals and givens, without an RFP interpreter by my side; and I don't see how the contractors can either!" Also from the same letter General Stewart wrote to *Defense Management Journal*, July 1972 issue, "I pledge every effort on the part of ASD to clear out what I now regard as an RFP jungle of administrative confusion." Finally, the key to the issue of the RFP business—program managers must think about the program before the RFP is written—is well stated as General Stewart goes on to say, "In this day of cost consciousness in weapon systems acquisition, I believe it behooves all program managers within DOD to start thinking about cost of ownership for a weapon system before the RFP is written."

I don't propose by this series of quotes from General Stewart's letter to imply he has the answers. I do mean that the attitude he has expressed will lead to the answers if the Stewarts and those who work for them and above them insist on building a solid business foundation under the RFP process. This sound business foundation in my view will be structured only at such time as we insist that the DOD businessmen, the procurement people, take a strong hand to the tiller and steer that log downstream.

Certainly there is a policy role—a major role —that needs to be faced squarely at all levels. An obvious need is to reinforce the business function throughout DOD as the key activity to bring about change. We need to ensure that system program managers at all levels look to the DOD procurement people to do what has to be done in the RFP business. □

Source Selection Process Faces Winds of Change

by Lt. Gen. James T. Stewart, USAF
Commander
Aeronautical Systems Division
Air Force Systems Command

The prototype programs, emphasizing simplified and streamlined management, procurement and development approaches, provide the kind of environment in which imaginative ideas can surface, be applied and tested. A good place to begin improving the acquistion process is clarification and simplification of requests for proposals (RFPs), which would provide opportunities to overhaul the source selection process. My current "crusade" in this regard started without fanfare about a year ago and, I must confess, has not resulted in a large number of successes. However, I am convinced the winds of change are blowing, and these changes will affect all future procurements by the Aeronautical Systems Division (ASD) of the Air Force Systems Command.

Undoubtedly, the best example of this fresh acquisition approach is the Lightweight Fighter Prototype Project which was one of the major programs to result from an Air Force prototype study initiated by former Deputy Secretary of Defense David Packard. I will use ASD experiences in the lightweight fighter acquisition process to illustrate our efforts to simplify RFPs and streamline our source selection process.

Straightforward RFPs

The RFP is generally DOD's first *formal* communication with industry on a competitive procurement. It is our opportunity to tell industry just why we are willing to spend some dollars, what's really important to us in the project (and thereby what isn't), what our procurement philosophy will be, and how we intend to grade industry proposals. We have shown in recent years a consummate lack of skill in exploiting this communications opportunity. Our stereotyped RFP format, which attempted to incorporate all the Armed Services Procurement Regulation (ASPR) instructions, evolved over the years to the point where it often managed in 250 pages or so to obfuscate issues with the skill of a magician. (For a couple of disguised examples, see Letters to the Editor, *Defense Management Journal,* July 1972, page 62). Whether these obfuscations are a result of too literal interpretation of the ASPR, or a lack of understanding of basic program objectives by the writers, or just plain bad writing—or all of these—is not the point. We must communicate to the prospective contractor what we want in simple terms.

The RFP issued by ASD for the lightweight fighter prototype proved this process can be reversed. In a one-and-one-half-page "executive summary," a four-page statement of work, a

two-page proposal requirements, one-and-one-half-page source selection criteria and a 22-page model contract, the contractor learned a great deal. For instance, the contractor learned the primary program objectives, basic tasks to be performed, performance *goals*, what his proposal would have to contain, financing, type of contract contemplated, and the basis on which the Air Force would pick the winners.

Not all RFPs, of course, can be as concise as this example, but *all* RFPs can be as clear and straightforward. We are working toward a format which begins with an executive summary. Each attachment after that will deal completely with a given subject or functional item.

Benefits of Limited Size

Limiting the size of the RFP has several benefits:

- It *forces* better writing.
- There are fewer opportunities for errors of inconsistency.
- It can be read and *understood* "in toto" at corporate officer level.
- Most importantly, it tends to *limit the amount of information to be submitted.*

Contractor responses in the lightweight fighter program were limited to 50 pages for technical proposals and 10 pages for management proposals.

All bidders stayed within these page constraints and our proposal evaluators unanimously agreed that sufficient data were available for them to make sound integrated engineering, management and procurement evaluations. While a 50-page technical proposal limitation may be inappropriate for a B–1 aircraft engineering development proposal, some page budget should be established for all procurements. This is especially true when you consider that the sole purpose of the RFP is clear, concise communication between the buyer and seller; therefore, simplified and straightforward RFPs are essential.

Lightweight fighter prototypes.

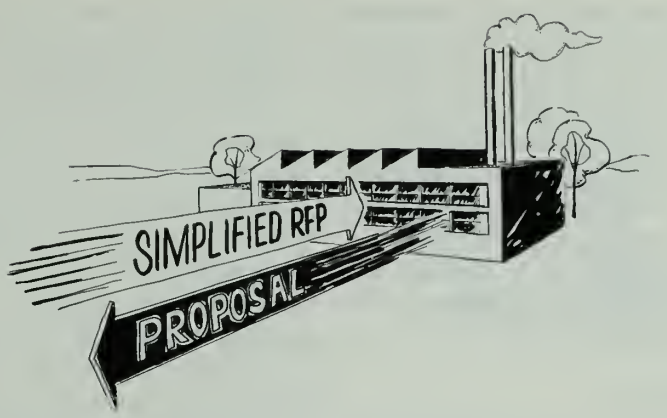
Streamlined Source Selection Process

With lightweight fighter prototype proposals of manageable size, we were able to streamline the evaluation process. The organization of the evaluation team was as simple as we knew how to make it. Twelve evaluators, carefully picked for their individual and collective expertise in the technical, management and cost areas, formed the evaluation committee which reported to me as the source selection authority. They were responsible for total integrated assessment of the proposals received in response to the RFP. They were encouraged to use advisors from anywhere within Government on an "as needed" basis, but they remained personally responsible for the evaluation they submitted. During the lightweight fighter evaluation, about 125 part-time advisors were used from the engineering organization at ASD, several Air Force laboratories, Air Defense Command, Tactical Air Command, Headquarters, U.S. Air Force, Air Force Systems Command and four NASA centers.

The evaluators needed to be

Chief of the Aeronautical Systems Division Prototype Office, Colonel Lyle Cameron, left, and Fred S. Wood review one of the 50-page responses to the lightweight fighter RFP.

thoroughly familiar, of course, with the project objectives, the statement of work, what was expected in the proposals, and the source selection criteria—a task made infinitely easier with a clear, concise RFP. Throughout the evaluation, I maintained close communication with the evaluation committee primarily to ensure that all areas important to making a thorough and objective source selection were being covered.



Other Data Sources

Data sources for the evaluation were not limited to contractors' proposals. Wind tunnel models were submitted by each proposer along with proposals. Basic subsonic and supersonic lift and drag polars were investigated with the assistance of NASA, emphasizing those areas differing from what was proposed. The 6570th Aerospace Medical Research Laboratory's centrifuge was used to simulate the "high g" cockpits proposed. Performance calculations were accomplished with the help of the Armament Development and Test Center computers. A wind tunnel at Wright-Patterson AFB was used to investigate nozzle drag of proposed designs. The ASD development planning organization was asked to respond to the RFP at the same time it was issued to industry. The resulting in-house designs were invaluable for comparison purposes during the evaluation.

With selected members of the evaluation committee, I visited each offeror's facilities before source selection was made. The purpose of these visits was to allow an on-site evaluation of prospective contractors' management, design and manufacturing capabilities. It also provided each competing design team the opportunity to tell us anything they thought we should know but had been constrained from including in their proposal because of size limitations. These visits further strengthened my conviction that the 50-page proposal was adequate.

Independent assessments were sought on complex or controversial issues. For example, an in-house ASD evaluation of the installed engine characteristics of one proposer's design was significantly different (and less favorable) than proposed. Because of the impact on expected performance, and perhaps on source selection, an independent evaluation was accomplished by NASA which corroborated the in-house work.

If additional data were requested by the evaluators or their advisors it had to pass an elegantly simple test before it was passed on to a prospective contractor—would the data requested, when provided, help the source selection authority make a better decision?

Proposal Scoring

No numerical scoring was used in the lightweight fighter proposal evaluation. The following adjective assessments were used:

Green—Outstanding, exceeds specified performance or capability and excess is useful, high probability of success, no significant weaknesses.

Blue—Acceptable, average, meets most objectives, good probability of success, deficiencies can be corrected.

Yellow—Marginal, inadequate, weak, low probability of success, significant deficiencies but correctable.

Red—Unacceptable or nonresponsive, key element fails to meet intent of RFP.

After evaluations against these standards were complete, comparisons *among* the proposals were made in areas of performance and cost.

Documentation of the process was kept to a minimum. The evaluation committee provided a summary report backed by supporting analyses and data. Their communications with me were pointed to key issues, including proposed versus evaluated aircraft performance, advanced technologies offered, strong points and areas of concern or risks. Important considerations were articulated by the evaluation committee, but decision flexibility was left to the source selection authority.

As a result of short, to-the-

point proposals, and evaluating only the key issues, the evaluation was completed in just five weeks. I had all the data I needed to make, with confidence, the source selection decision. Even those companies not selected expressed a view that the evaluations were thorough, stayed on the right issues and were eminently fair.

Future Use

Unfortunately, not all the lessons we learned during the lightweight fighter solicitation are universal, *i.e.*, apply equally well to all procurements. However, there are some lessons we can apply.

The RFP is the key to improving the procurement process. A clear straightforward statement of what we want to buy gives private sector managers the necessary understanding they need to evaluate their companies' responses and determine if they satisfy the program objectives. In short, it gives them the opportunity to be managers. This opportunity is often denied them when solicitation is complex and fragmented (and sometimes contradictory).

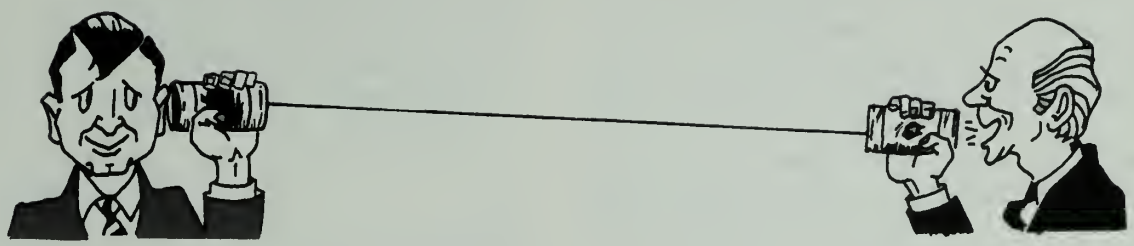
In a similar manner, we must ascertain that our solicitation addresses only those elements essential to satisfying the currently understood system requirements. We must ruthlessly eliminate frills and nice-to-have additions. Further, we must differentiate between requirements and goals. These principles are fundamental in the design to cost concept. A system's opportunity to meet cost targets can be directly related to the way the requirements goals are stated in the RFP. If the design to cost concept has any validity —and it does—then we must improve the RFP process.

It is possible to shorten and change the solicitation process without breaking the law by violating the ASPR. Not a single waiver was required in the lightweight fighter prototype source selection.

Qualitative evaluation actually improves the selection process without compromising objectivity. However, this type of evaluation cannot be used if evaluators do not understand what the Air Force wants and cannot read and/or fully comprehend the contractor's total responses. Clearly, an integrated assessment is nearly impossible when the RFP contains hundreds of pages and the response contains thousands of pages.

In this regard, I am now convinced that some page limitation is necessary on all future solicitations and responses. The lightweight fighter proposals were literally packed with the kind of data needed for source selection. There was no room—or need—for brochuresmanship.

I believe all future solicitations from the Aeronautical Systems Division will reflect the results of these lessons. We can't change our "house" overnight, but I pledge every effort on our part to clear out what I regard as an RFP jungle of administrative confusion and to use the opportunities this provides to improve ASD's source selection evaluation Process. ☐



"Communications Effectiveness" Needed in RFP-Proposal-Contract Award Cycle

Poor proposals are frequently the result of poor requests for proposals (RFPs). Overwhelmingly large proposal packages—stacking six to eight feet high—are *always* the fault of the RFP.

The combination of an ineffective RFP and poor responding proposals compounds the problems of the source selection evaluation board in making the best contractor selection. This is certainly an unacceptable state of affairs considering the main purpose of the RFP and proposals should be to make an evaluation as easy and clear-cut as possible.

In any R&D competition, whether for a small research program or development of a complex new system, it is obviously DOD's goal to select the contractor who is *truly* best qualified to handle the job. This selection is made largely, and sometimes entirely, on the written communications during the RFP-proposal-contract award cycle. Therefore, the degree of effectiveness of these communications has tremendous impact on making the correct selection.

by Steele Morris

(Mr. Morris wos Principal Engineer-Monoger of Proposal Quality Assurance, Aerojet Generol Corp., Socromento, Colif., prior to his retirement, ond o Proposol and RFP Consultant for Peot, Morwick, Livingston & Co.)

Opinions expressed herein are those of the author ond not necessarily those of the Deportment of Defense

RFP Communications

Communications in the RFP strongly govern the type and scope of communications in the proposal detailing the bidder's concepts and qualifications. Proposal communications, plus those in the RFP, become the combination that affects the contract award decision. In this process, the RFP is the controlling document.

In assuring the best, most cost-effective defense systems for the Nation, DOD and industry have joint responsibility for maximizing the effectiveness of all communications within the RFP-proposal-contract award cycle.

The term "communications effectiveness," as used in this article will have a broader connotation than that of merely communicating what you have to say so it is clearly understood. It also includes the effectiveness, completeness and appropriateness of the ideas, concepts, analyses and reasoning processes relating to the research program or system development under

consideration.

If an RFP communicates poorly causing some portion of it to be misinterpreted, there is no assurance the misinterpretation won't be made by the best qualified contractor. Even though he may be the truly best qualified contractor, his *true* capabilities may be obscured if parts of his proposal are unclear or incomplete. His proposal may be downgraded during evaluation, or even disqualified, not because of his fault but due to poor communications effectiveness of an RFP which is supposed to be clearly guiding the proposal activities.

The purpose of this article is to consider these problem areas, to show what was done by a bidder to solve some of them in the proposal area and to suggest possible solutions in the RFP area. To put what follows in proper perspective, a few words about my own experience would be appropriate. It has included 20 years in the aerospace industry, primarily devoted to improving the quality, or communications effectiveness, of proposals. It has covered planning, writing, reviewing, evaluating and analyzing hundreds of proposals.

Proposal Problem

Any contractor who is really out to win a proposal competition assigns capable personnel to his proposal team and makes every effort to submit an outstanding proposal. In spite of such determined efforts, the communications effectiveness of a great majority of proposals is amazingly poor. Anyone who ever reads a sampling of proposals, including those for both small and large procurements, will probably find most of them are of such indifferent quality that it is hard to believe they were ever submitted. They violate almost all the criteria for good communications. Many are poorly organized, uninteresting, unclear and unconvincing. Many contain unproved claims, extraneous material and illogical reasoning.

This was just what we found, after taking a serious look at the proposals being turned out at the company where I worked. Since this was no way to get new business and our high percentage of losing proposals proved it, we decided to do something about it.

Attacking the problem systematically, we developed a company in-house proposal evaluation form to measure the communications and sales effectiveness of a proposal in 68 areas, covering various details applying to the following characteristics that need to be considered in developing a high quality proposal.

- Fully responsive to RFP.
- Demonstrates that the RFP requirements are well understood.
- Defines technical and management objectives.
- Defines technical and management approaches selected.
- Presents trade-offs and reasoning processes leading to selection and rejection of approaches.
- Analyzes risk factors.
- Proves all claims.
- Defines problem areas and presents solutions.
- Details work to be done under contract and when.
- Meticulously well organized.
- Extremely clear and to the point.
- Omits extraneous material and boiler plate.
- Complete.
- Interesting.
- Easy to evaluate by the source selection evaluation board.

By comparing the ratings of winning proposals in the 68 areas of measurement with those of losing proposals, a computer program determined the relative impact of each area on proposal success. This effort also determined the weight to be applied to each area in arriving at the overall weighted rating for each proposal. An excellent correlation was found between the weighted ratings and success or failure in a complete sample of 102 competitive R&D proposals. Success or failure was predicted with an observed accuracy of 80 percent. An extremely significant finding was that nine out of 10 proposals, rating less than 80 (out of a possible score of 100), were unsuccessful and about 70 percent of proposals rating 80 or higher were winners.

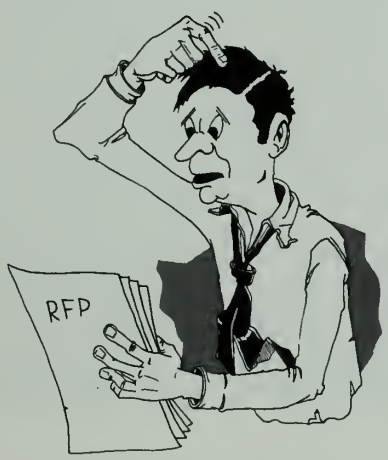
This study covered over 13,000 individual quality ratings and established definitive methods for increasing the communication and sales effectiveness of proposals. Application of these methods during the 4-year period covered by the study increased the proposal capture rate nearly threefold.

By attacking the communications problem

systematically, we found a sound method for improving proposals, but the optimum level of communications effectiveness possible by this approach cannot be achieved if the RFP is poorly conceived. After all, it is the RFP that guides and directs the type of proposal responses to be received.

RFP Problem

During the proposal improvement program described in the foregoing, many hundreds of RFPs were analyzed to ensure the requirements and desires of the Government were understood and that proposals would be as fully responsive to the RFP as possible. I use the phrase "as fully responsive . . . as possible" because when an RFP is obscure in its contents, the bidder really has no way of being sure he is being responsive. Many RFPs are poorly organized for clear understanding, nondefinitive and *sometimes* misleading and subject to misinterpretation. Frequently, they reflect little effort to alleviate the volume-of-data problem—what is to be included in the proposals or what is to be delivered under contract.



Quality of the final proposal is bound to lessen if a bidder is diverted from productive proposal activities by trying to make heads or tails out of a poorly prepared RFP and trying to develop an orderly, logical and responsive proposal outline. When this wasted effort and frustration are eliminated, proposal quality automatically improves.

It seems to me the overall objective of an RFP is to provide bidders with adequate information and guidance, presented in a clear and logical manner, to elicit proposals containing all the information needed for objective evaluation and prepared in uniform format so competing proposals can be evaluated *almost* on a paragraph-by-paragraph basis. To achieve this goal, RFPs should meet requirements discussed in the following paragraphs.

Organization of RFP

In preparing the outline for the RFP, special pains should be taken to organize the material from the bidder's viewpoint with sections arranged so the bidder gets the story in a logical step-by-step fashion. It may well be the RFP communicates the first knowledge the bidder has of some, or all, of the concepts and requirements included. They should be presented very explicitly explaining the hows and whys of the concepts and requirements. Experience shows the extra time spent in planning and creating an effective RFP outline will really pay off in greater communications effectiveness, just as in preparing a proposal outline.

A few years ago I acted as a consultant during preparation of an RFP for a multi-million-dollar procurement. My task was to review the RFP from the bidder's viewpoint and help structure it for maximum communications effectiveness. The sample RFP outline in Figure 1 (see next page) is patterned after the one devised for this procurement.

It was decided an Executive Summary was as important in an RFP as in a proposal. Such a summary, preferably unclassified, is an effective means of making the bidder's top management aware of the Government's goals and just what the contractor is expected to do, both in the proposal and under contract. A good Executive Summary can stimulate improved contributions from top management to the proposal effort. It also becomes an effective starting point for everyone on the proposal team.

Boiler Plate

In an attempt to exclude extraneous material from a proposal, RFPs generally discourage bidder's use of boiler plate. Yet, in most instances, RFPs begin with a packet of Government boiler plate forms. Some of these are listed under Section B in Figure 1. In many

Sample RFP Outline for Large System Procurement

A. Executive Summary
1. Objectives and Intent of RFP.
2. Brief System Overview.
3. Summary of Acquisition Cycle.
4. Work to be Done under Contract.
5. Objectives of Proposal.
6. Production Potential.
7. RFP Table of Contents and Relationship of Parts.

B. General Provisions
1. Procurement Request.
2. Instructions to Offerors.
3. Schedule and General Requirements.
4. Supplies and Services to be Provided.
5. Packaging.
6. Inspection and Acceptance.
7. Contract Data Requirements List.
8. Security Requirements.

C. General Information
1. Background.
2. Overview of System and Design Requirements.
3. System Acquisition Cycle.
4. Government Plan for Project Management.

D. RFP and Proposal Information
1. RFP:
   a. RFP Review and Request for Clarification.
   b. Submission of Proposals.
   c. General Proposal Evaluation Information.
   d. Incentive Structure.
2. Proposal:
   a. Objectives of Proposal.
   b. Form of Proposal and Information to be Furnished.
   c. Detailed Evaluation Criteria.
   d. Statement of Work.
   e. Alternate Proposals.

E. Detailed Technical Specifications & Requirements

F. Contract Technical Data Requirements

G. Contractor Guidelines
1. Project Management.
2. System Engineering.
3. Configuration Management.
4. Integrated Logistics Support.
5. System Test.
6. Reliability and Quality Control.
7. Maintenance.
8. Life-Cycle Costing.
9. Other guidelines, as necessary.

H. Results of Prior Studies

I. Reference Documents, Glossary of Terms, Cross-Referenced Index

Figure 1

respects the RFP would be far better organized if at least some, if not all, of this material were included in other, more appropriate, sections of the RFP. For example, the contract data requirements list (Item 7, Section B) could well be placed in Section F where these requirements are discussed in detail.

Section C (General Information) forms the real start of the RFP detailed discussion. It presents a detailed overview of the system background, system characteristics, principal requirements, acquisition cycle and management information. This information orients the bidder before he has to get involved with all the minute details required by the RFP in sections that follow.

Section D states requirements relating to the RFP and submission of proposals, with particular emphasis on the type of proposal requested and the evaluation criteria. The remainder of the RFP covers the detailed technical requirements and specifications, data requirements, guidelines, results of prior studies and referenced documents.

Technical and Management Requirements

The objectives of the technical and management approaches should be clearly defined in an RFP. Once these objectives have been established, it is essential all requirements and specifications reflect these objectives, are realistic and are sufficiently complete to define the system. Because these requirements affect the scope of work to be done, the time it takes to do it, the reliability and performance of the system and the costs, the requirements should be carefully scrutinized and trade-offs conducted with the aim of relaxing or eliminating requirements that can be costly or difficult to achieve and yet have only small impact on system optimization.

As one example of what can happen when requirements are unrealistic, or even misleading, consider the following case which is based on an actual RFP. A *major* requirement was that use of state-of-the-art technology was *essential* to ensure maximum system reliability and minimum program risk. The goal for the system weight was, say, 5,000 pounds—a value not too difficult to achieve. A lighter-weight system was not desired because of the reliability and risk factors already mentioned. This was emphasized in the RFP not once, but many times. In fact, the contract incentive formula included penalties for weights in excess of 5,000 pounds, but no bonuses for lighter weights.

Contractor A was responsive to the RFP and bid a system weight of 5,000 pounds, although a lighter weight could have been achieved with little program risk or increase in costs. Contractor B bid a lighter-weight system and won the contract. I don't know whether Contractor B won the contract because of lighter weight or not, but it is my understanding the system program office was highly pleased with the lighter weight. The fact the winning contractor violated the RFP requirements means that Contractor A was effectively penalized by being fully responsive to the RFP.

Another example is an RFP for continuation of a contract for engineering support services. It was definitive enough for the incumbent contractor, but not sufficiently definitive for other bidders. Afer submitting their proposals, the bidders protested and a new RFP had to be issued and new proposals submitted. Because of inadequate requirements in the initial RFP, expenses were increased by the need for preparation of a new RFP and new proposals, and selection of the follow-on contractor was delayed several months.

In still another case, an RFP requested costs for production of 50, 100, 500 and 1,000 units. Bidder A's prices on 50, 100, and 500 units were lower than those of Bidder B; however, his price for 1,000 units was higher. Because of this price Bidder B was awarded the contract. Bidder A then protested on the basis there was no conceivable requirement for 1,000 units. Since this was found to be correct, new RFPs were issued, new proposals submitted and the original contract award decision was reversed and awarded to Bidder A. Unrealistic requirements, carelessly included in the RFP, delayed initiation of an important procurement.

Yardsticks for Trade-Offs

When bidders are required to make trade-off studies to select the best approaches, the relative importance of such factors as weight, performance, reliability, development time, risk, maintenance and costs should be defined. Only in this way can the trade-off studies of the various bidders be evaluated on an objective basis.

Evaluation Criteria

Firm criteria for proposal evaluation should be given, as well as the actual or approximate weighting factor for each of the criteria or

group of criteria. Since the purpose of the RFP is to elicit the best possible responses from all bidders reflecting the true desires of the system program office, what can be gained by making the evaluation process mysterious? The bidders ought to know the rules of the game. If they don't, the evaluation board runs into evaluation problems because the various proposals will reflect different degrees of emphasis in various areas. The bidder who comes nearest to *guessing* the right answers gets a higher score. Yet, he may not be the best qualified contractor for the program.

Minimize Contractor Data Requirements

The volume-of-data problem, both in proposals and under contract, continues to plague everyone. The problem can be greatly alleviated if the system program offices responsible for preparing RFPs would tackle the problem and do something about it.

In the early stages of an RFP exercise, a data call is directed to specialists in such areas as system engineering, testing, quality assurance, logistics support, configuration management, program management and life-cycle costing. It is the job of each specialist to recommend data requirements he wants in the proposal and under contract. It is human nature that each specialist will concentrate only in his area and try to ensure it is covered completely, with no loopholes. More often than not he comes up with every bit of data, supporting studies and reports that he can think of. Yet, in order to limit the volume of data, a directly opposite approach is essential. The specialist needs to respond to the data call with the absolute minimum of requirements which will ensure program goals.

To achieve such a minimum in data requirements, the system program office should supply guidelines with the data call. Then, when recommended requirements have been submitted by the area specialists, the program office must integrate these requirements to delete nonessential data, simplify others and eliminate duplication. Whether this requires 10 manhours or hundreds of manhours, the effort will result in reduced data preparation by the contractor, less data analysis and report reading by the program office and reduced contract costs.

The yardstick for deciding on essential or nonessential data requirements can be simply stated: "Is this information essential, on a performance or cost-effective basis, to the desired system and to program success and will the data actually be *used* to these ends?"

Referenced Specifications

The average RFP references various regulatory documents including the Armed Services Procurement Regulation, DOD directives, Military Department regulations, etc. The mass of generalized, detailed, duplicated and conflicting information in these documents is overwhelming, and possibly only clearly understood by specialists in the disciplines being covered. As a nonspecialist in the disciplines, I have read many and have been appalled at their sheer massiveness, let alone their poor organization and communications effectiveness. Any effort by DOD to simplify and clarify these regulations would be a boon to contractors and the Military Services alike.

The system program office preparing the RFP cannot rewrite these regulations, but it can perform a valuable service that will streamline the responding proposals, reduce the volume of data and probably reduce contract costs. Specify the *degree* to which each referenced document is applicable in the contract and the degree to which it is to be discussed in the proposal.

For example, RFPs often specify that quality control shall be in accordance with Specification MIL–Q–9858A. I have read many proposals that responded to this requirement by repeating MIL–Q–9858A essentially verbatim, stating that each requirement will be observed under contract. When I have queried the quality control people why this detailed response was considered necessary, the answer has always been that if this wasn't done the proposal might be considered non-responsive to the RFP.

It hardly seems that a verbatim repetition of the specification is really what the program office wants. Maybe all that is wanted is *proof* the bidder is familiar with the specification and that he is already operating under its requirements. Possibly the program office would like an analysis of the quality control problem areas raised by the special characteristics of the de-

fense system involved; and the sections of MIL–Q–9858A that require particular emphasis because of these problems. Whatever the desires of the program office, better, more compact proposals will be received when these desires are defined in the RFP and the degree of specification compliance stated. To be precise, the program office may wish to specify both what is wanted and what is not wanted in the proposal and under contract.

Proposal Outline

To make certain that responding proposals are complete in their contents and uniform in their format, a definitive proposal outline should be specified in the RFP. Such a definitive section-by-section outline would not necessarily limit the originality of the bidders' responses. Bidders can be as original as their capabilities permit within each section of their proposals. Within the page limitations established by the RFP, they can expand the outline by adding either subsections to those already specified or new sections. This should be stated in the RFP.

Tracking of RFP Elements

One quite common fault of RFPs is that the specified proposal outline isn't arranged to accept other elements of the RFP such as certain items of the statement of work, evaluation criteria, or work breakdown structure. The elements don't track with one another—they can't be made to mesh together properly.

Let's consider an example of such a conflict which is patterned after one encountered in a large system RFP. As shown in condensed form

Tracking and Non-Tracking RFP Elements

Proposal Table of Contents Specified by RFP	Statement of Work	Proposal Evaluation Criteria	
Section I		Item A	Acceptable Tracking
II			
III	Task 1	B	
IV	2		
V	3	C	
VI	4	D	
VII		E	
VIII		F	
IX			
X	5	G	
	6	H	No Tracking
	7	I	
	8		

Figure 2

in Figure 2, the specified Proposal Outline consisted of 10 main sections, each appropriately titled as to contents. The statement of work comprised eight tasks. Tasks 1 through 4 could be covered in Sections III through VI, and Task 5 in Section X. No place was provided for Tasks 6 through 8. Similarly no place was provided to cover Items H and I of the evaluation criteria.

I have seen hundreds of manhours expended by proposal managers and their proposal teams trying to resolve such conflicts. Many times there have been no good solutions and patched-up proposals resulted. Since all bidders faced the same problems, the nonuniformity of the proposals must have posed a real evaluation problem.

When the RFP elements don't track with one another or the proposal outline, bidder frustration results, valuable time is diverted from the proposal effort and poor proposals result. The communications cycle breaks down completely and selection of the truly best qualified contractor can be jeopardized.

Proposal Size Limitation

Oversize proposals, some stacking six to eight feet high or higher, are simply the fault of RFPs in not limiting the number of pages allowed. For uniformity of response and ease of evaluation, proposal size must be limited on the basis of number of pages, type size and lines per page. The size limitations imposed must bear a realistic relationship to the amount of material a bidder must supply to meet requirements spelled out in the RFP. One approach to determining reasonable limitations is to have each area specialist provide the system program manager with his recommendation of the number of pages required to respond to his section. When these are totalled up, the program manager has a starting point for paring them down to a reasonable size.

Setting page limitations for individual sections of the proposal seems unwise, since it can stifle a bidder's originality and possibly weaken the impact of his proposal. As one example, some RFPs specify an Executive Summary not to exceed three to five pages. Many of the summaries that I have prepared and many I have read have been four to five times that length, and would not have been fully effective if they had been appreciably shorter. Limit the overall size of the proposal by all means, but give the man a chance to say what he thinks is important within each section of the proposal.

Once the total page size has been set, an excellent way to decrease the *effective* size of large proposals and greatly simplify the evaluation is to require proposals be submitted in three main volumes: a *basic* proposal, supporting data and a cost package. If the total page limitation is 1,200 pages, the basic proposal might be set at 300 pages, supporting data at 700 pages, and the cost package at 200 pages. The basic proposal package would contain sufficient information relative to engineering and management concepts, reasons for selected approaches, work to be done, etc., to enable the evaluation board to perform its function almost entirely upon this information, assuming that all claims in the basic proposal can be verified by the supporting data. Obviously, at the discretion of the bidder, some data in the form of trade-offs, important analyses and information needed to prove unusual and novel concepts could be included in the basic proposal.

Clarity of Communications

For maximum communications effectiveness, the content of an RFP must be written so clearly that nothing can be misunderstood by the bidders.

To produce high quality proposals, all write-ups should be reviewed and criticized by individuals who had nothing to do with writing them. The originators of the material are too close to the work they have prepared, and too knowledgeable, to be able to see where their material may be unclear, unsubstantiated, or illogical.

The same problem exists in turning out clearly written RFPs. Objective nonparticipating reviewers should critique the write-ups from the bidders viewpoint and recommend changes needed to improve communications.

Summary

The success of the RFP in terms of communications effectiveness depends upon the dedication and skills of the system program manager.

It is a demanding task to weld together the RFP team and coordinate its activities. To achieve the objectives of the RFP with maximum assurance of success, and with minimum confusion and rework, requires comprehensive planning long before the bulk of the RFP inputs are initiated. Some of the first steps include preparing a strawman RFP outline, and assigning area specialists and defining their responsibilities. A realistic RFP preparation schedule should be established permitting time to coordinate and review the work of contributors, and to clarify areas of uncertainty. A flow chart showing all activities and interrelationships, as well as input points and decision points, is one method of clarifying and controlling the activities involved.

Experience shows that *decision-making* meetings proceed at a geometric rate inversely related to the number of participants, as shown by this actual example:

Participants	*Rate of Decisions per Hour*
12	1
6	3
3	9

Thus, RFP preparation will progress faster if decision-making meetings are limited to three or four participants; specialists can be on call when needed for additional information. Although this approach involves the program manager in more meetings, far fewer total manhours will be expended and RFP drafts will require fewer and less extensive rewrites.

During the RFP-proposal-contract award cycle, communications have a beginning and an ending and the excellence of the beginning affects the excellence of the ending. The beginning is the RFP. □

AFMA
Annual Conference

The 18th Annual Armed Forces Management Association (AFMA) Conference will be held at the Statler-Hilton Hotel, Washington, D.C., March 26–27. Theme of the conference will be Department of Defense in an Era of Peace.

Discretion Is the Better Part of Valor in Negotiated Procurement

Over the years formal advertising has been very precisely and completely defined as a procurement procedure. Negotiation, on the other hand, is defined simply as procurement without formal advertising. While negotiation and formal advertising are often thought of as two different but comparable systems, the fact is that negotiation is not a system within itself. Negotiation, such as emergency procurements or small business restricted advertising, is hardly distinguishable from formal advertising. At the other extreme, negotiation of a sole source procurement for some complex and esoteric supply or service, which may involve extensive research and development, bears little resemblance to formal advertising. In the latter situation, competition can be achieved but specifications are too indefinite to permit the use of formal advertising.

The Comptroller General, largely through the medium of the bid protest, examines on a contemporaneous basis the validity of contract award procedures. In formally advertised contracts, the Comptroller General's review ensures compliance with regulations and his prior decisions. In negotiation there was at the outset no comparable body of rules. The Comptroller General's decisions on negotiated contract awards in the early 1950s were limited largely to a consideration of whether or not any of the exceptions provided by statute requiring use of formal advertising had been properly invoked.

by Paul Shnitzer
Associate General Counsel
U.S. General Accounting Office

Opinians expressed herein are those of the authar and not necessarily those of the Department of Defense.

Development of Negotiation

The Congress occasionally indicates its concern whether or not the Government's interests are being properly protected in negotiated procurements. There is apparently a feeling in Congress, whether or not justified, that these interests are sufficiently protected by mere adherence to formal advertising procedures. As a result, Congress has attempted to compensate for the greater degree of flexibility in negotiation by a series of enactments. These are calculated to provide either an after-the-fact review, *e.g.*, access to the contractor's records by the Comptroller General or by greater formality in the award process.

Congress required greater formality by the

truth-in-negotiation provisions of Public Law 87–653, applicable where competition is lacking. The same law also requires written or oral discussions with all offerors in the competitive range. Public Law 90–500 requires that price be included in solicitations and procurements be published in advance in the *Commerce Business Daily*.

The legislative provision for conducting discussions has necessitated new procedures which, while retaining a considerable degree of flexibility, must be followed in the competitive negotiation process.

Competitive Range

In terms of formalizing the negotiation process, the provision of Public Law 87–653, codified as 10 U.S.C. 2304(g), is the most significant. Applicable with certain exceptions to any negotiated procurement over $2,500, this law calls for "written or oral discussions . . . with all responsible offerors who submit proposals within a competitive range, price and other factors considered." Unlike formal advertising, the flexibility of negotiation allows a give and take between contracting officer and offeror and should be used to obtain a contract in the Government's best interests.

The language of the statute clearly requires a definition of competitive range. An offeror is held to be in the competitive range if his proposal can be improved reasonably to the point where it becomes the most acceptable. Thus an offer or proposal may not be excluded from the competitive range for failing to pass a benchmark test. It would be retained in competition, if it appears to have reasonable potential to meet specifications and become the most attractive offer. It is largely within the contracting officer's discretion, subject to established standards, to decide who is within the competitive range.

Discussions in the negotiation process should be meaningful and directed toward possible improvement of the offer. In proper circumstances, deficiencies in the offer should be pointed out. However, since the purpose of the discussions is to foster increased competition, deficiencies need not be pointed out where the result when doing so would reduce rather than increase competition. Thus, if the competition is intended to measure the ingenuity of a particular approach, care must be taken to avoid "transfusing" a slower offeror with the ideas of his more ingenious competitors. Also, continuing discussions in such situations may serve to infuse ideas of the Government technical staff into all of the offers within the competitive range to the point that they become essentially equal, leaving no real basis for choosing among them.

Evaluating Factors

Unlike formal advertising, it is proper in competitive negotiation to measure comparative quality and price or, in the case of a cost-type contract, anticipated cost. In view of these factors and the relative vagueness of the specifications, prospective offerors must be made aware of the importance of the various factors to be evaluated in the contractor selection process. Intelligent competition cannot be achieved unless, prior to preparation of their proposals, offerors are advised of the evaluation factors to be used and the relative importance of each. Otherwise the offeror is at a loss to know if the procurement is intended to achieve a minimum standard of quality at the lowest cost or if cost should be considered secondary to quality.

In negotiating a contract award, the solicitation will often set out a maximum achievable score for each major evaluation factor or category of such factors. This provides the most precise indication of relative importance. Evaluators should keep in mind that when the factors being measured are largely subjective, such as previous experience, staffing plan, quality of organization or management, the use of precise numbers would not make such factors any more objective.

Thus, where the maximum achievable score is 15,000, an offer scored at 12,855 should not automatically and without further examination be considered superior to an offer scored at 12,850. The evaluation system is not so precise to allow the assumption that such small differences are necessarily meaningful without further deliberation to either select the winning contractor or merely to decide who should be included within the competitive range.

This is another reason why the competitive range should be decided on the basis of the array of scores achieved; it is not proper to set up a predetermined "passing grade" for putting

an offeror in the competitive range. For example, assume a predetermined "passing grade" of 70 points. If out of a maximum of 100 points, offers A, B and C achieved scores of 96, 94 and 93, respectively, it probably would make little sense to consider offer D with a score of 71 to be in the competitive range. However, if scores for A, B and C are 72, 71 and 70, respectively, the contracting officer would be hard put to justify excluding offer D at 69.

Procedure

The procedure followed in competitively negotiated procurements is not uniform. Generally, a solicitation, called a request for proposals (RFP), is issued to prospective contractors stating as clearly as possible the Government's needs with the required indication of the evaluation factors and their relative importance. A deadline is indicated for submission of proposals. The submission deadline, with rather limited exception, for procurements subject to the Armed Services Procurement Regulation (ASPR) is strictly enforced and, in most cases, a proposal submitted after the deadline will not be considered for award.

Technical and cost aspects of each offer are separately considered by advisory teams, which results in some types of comparative evaluation either as precise scores or some less specific indication of relative merit. This evaluation is advisory and not binding on the contracting officer. If the solicitation so provides and it can be clearly demonstrated that acceptance of the best initial proposal without discussion will result in fair and reasonable prices, award may be made by the contracting officer at this point. While late proposals may not be considered for award, they may be used to determine whether or not prices in the best initial proposal are, in fact, fair and reasonable.

If no award is made at this point, the competitive range is determined. Written or oral discussions as previously described are then conducted sequentially with all offerors in a competitive range. A common cut-off date is set for the submission of modified offers and remaining offerors are advised of the deadline date for submission of best and final offers. Requirements of the solicitation may be changed at any time but all contending offerors must be advised of the changes and given an opportunity to revise their offers on the basis of those changes. Changes in the solicitation may not be so extensive that they alter the character of the procurement. Such extensive change could be expected to affect the competition obtained and generally calls for a resolicitation.

The contracting officer may hold additional rounds of negotiations if he considers such action warranted. In each case a new deadline date must be set for submission of best and final proposals.

Final proposals received within the time set are then evaluated. If scoring was used initially, they may or may not be rescored. As already noted, the scoring or other comparison is advisory. While the contracting officer may and usually does follow advisory evaluations, he is not required to do so. However, he may not make material changes in the evaluation factors or their relative importance.

Fairness in Award Selection

Competitive negotiation is intended to achieve adequate competition in a situation where formal advertising is not practicable. It must be conducted in a manner that will not deprive the contracting officer of the discretion which is properly a part of negotiation.

In recent years, an increasing number of negotiated procurements have been protested to the Comptroller General. His decisions indicate a concern with procedural fairness including:

- Making the solicitation available to interested parties.
- Advising offerors of requirement changes.
- Establishing the competitive range on a reasonable basis.
- Permitting opportunity for discussions.
- Fixing and observing common cutoff dates.

In addition, the Comptroller General's decisions indicate a need for the contracting agency to justify that the selected offer conforms to the announced evaluation factors and their relative importance. This does not mean that the Comptroller General plans to superimpose his judgment on the contracting officer. It does mean that the contracting officer must be able to justify that his selection fulfills the purposes of the procurement and applicable statutes and regulations. □

Manager Communications: Organization Lifeline

Organization communication is comparable to the nervous system of the human body. It is imperative that communication exists for the very life of an organization. When managerial communications begin to fail, there is suspicion of organization arterial sclerosis. Organization communication arteries can literally become calcified, therefore permitting minimal information flows through the channel. There are many reasons why these "pipes" get clogged. Many times it is an inability on the manager's part to communicate to subordinates what he wants them to communicate to him.

Communication in an organization starts with sensors. These sensing devices, which are equatable to the nerve tips of the body extremities, need to be placed throughout the organization and must be kept tuned to recognize *vital* information—that information which the manager needs for the very "life blood" or decision making of his own organization, thus there is a need to communicate to the sensors what information is vital. The manager who feels that it is only up to him to be the gatherer of information will find that he will get distorted and limited information because of the communication barriers that can exist. But by grooming and training different individuals throughout the organization what they ought to be listening to and be attuned for, he has a higher probability of keeping in touch with vital information.

The manager and the supervisor are the prime agents for intra- and inter-group communication. They are the prime channel for communicating the effectiveness of their group. It is their responsibility to gain recognition and stature for their group and, particularly, for high-producing individuals within their group. They are missionaries of recognition in the organization. A manager has responsibility to communicate downward, but his greater emphasis is on communicating his group's services to higher management and to gain impact for his group. Many a department has found itself in a state of mere existence with nobody paying any attention to it anymore. The group seems to function unto itself in an isolated organization corner. Such groups sometimes are the subject of inquiry. People begin to ask "What does that department do? Is that division still with us?" This is a striking case where a group's manager has failed in his communication responsibility. He had probably spent more time communicating to his people than communicating the services, contributions, etc., of his group to the organization's higher management levels.

by Dr. Mark B. Silber
Associate Professor
Loyola University of Chicago

Opinions expressed herein are those of the author and not necessarily those of the Department of Defense.

Employees look to a manager not only to give information, but to represent them. Employees emotionally churn because their manager has not focused attention on their contributions. Many organizational units fail to get their budget requests approved because a manager has done an ineffective job of laying the groundwork in the first place. Higher management does not know what that group is doing so there may be limited budget allocations. An effective manager does not wait until just a week before budget proposals to start talking about his group's contributions or to bring stature to his group's accomplishments. If the group is producing and there are achievers in the group, the manager has the responsibility to his people and to his own career to focus the limelight on those high-producing individuals.

What Needs To Be Communicated?

The goals and the purposes of his group are important facts a manager must communicate. Some top management people forget what a certain group is doing; somehow they don't really know the output and mission of the group anymore. It is also the responsibility of the manager to communicate feelings. Many times managers choose only to communicate facts. When employees are becoming restless, unhappy and dissatisfied, or when they are happy and chomping at the bit with enthusiasm, it is important to communicate those feelings to higher management. Facts may be communicated, but the input on what is happening, emotionally, in the group is forgotten. For performance effectiveness, he also communicates needs and problems. The manager who only tells his superior that everything is running smoothly—"We don't have a need in the world" —is deluding himself or may be making an attempt to delude his own management. It is important for a manager to focus higher management's attention on his problems, needs, and the barriers to accomplishing the objectives of his group.

It is not suggested that managers should be "rebels without a cause;" rather they need to be "communicators with a cause." When a manager has barriers and problems, he must communicate them. Higher management cannot begin to do something for a manager, unless it intimately knows and emotionally feels the needs of a situation.

What Do Employees Want To Know?

Employees should have a broad overview of why they are engaged in their activities. They are interested in knowing the broad impact of their activities on the total system. People want to know the needs of higher management. They hear rumors about topside problems and these rumors become distorted. They want to know from their manager what is true and what is not true.

Secondly, they want to know the problems because employees want to help with problems. In fact, when an organization has topside problems, the employees generally will hear about them through rumors. A manager does well to truthfully communicate what the needs of the organization are. Where there is a problem, employees tend to come up with suggestions to correct these needs. The motivation for these helpful suggestions is mixed; the question is the opportunity for employees to contribute suggestions to handle these known organization problems.

Communicate the genuine problems the overall organization, division, or department is facing. When a manager tells subordinates these concerns, there is the payoff of identification with the organization and with their own human importance. There is a feeling of belonging because management trusts employees to have information. Many organizations tend to restrict needs and worries from the employee. Possibly these managements feel that employees can't do anything about the problems anyway or need to be treated as children.

Employees want to identify with the genuine welfare of the enterprise. When people know and are asked to suggest how *we* can solve this problem, it then becomes *our* problem. It becomes *our* problem, not *their* problem, resulting in increased group cohesiveness and solidification. Employees do want to know the impact of their contributions, to know management's problems, management's feelings, and management's worries. People like to identify where they work. They like to know when the organization is succeeding, its new projects, and future plans. When management deprives employees of this type of information, the "we feeling" suffers.

The manager is the corporate heart in the

traffic of ideas. He is the middle man in the traffic of ideas, and a prime mover for interactions. This is a responsibility of a manager. It's his responsibility not simply to be a passive go-between, but rather an active solicitor and organization pump for ideas.

He promotes idea flow, the flow of needs, and the flow of feelings between the management culture and the subordinate culture. The management culture has its values, needs, behavior, different ways of living, different allocation of time.

On the other hand, the subordinate culture has its set of values, how to live in its organization, code of ethics, sanctioned behavior. The manager communicates between these two cultures. As the man in the middle, he makes the higher culture understand the values, needs, problems, and feelings of the employee culture and, in turn, he communicates to the employee culture some of the feelings, needs, and problems of the manager culture. He functions as a translator, an interpreter, and an emotional shock absorber between the two microsocieties within the organization.

Communication Techniques

These five points may be helpful to a manager making a presentation to higher management. The overall objective is to get his proposal accepted—at least get his idea into the approval pipeline. Many "drop the ball" at the first stage. They get the ball as far as their own supervisor, but it never gets higher for approval. Some of these techniques will assist in getting proposals into the approval chair for action and implementation.

- *Frame of Reference.*

Present the proposal so that it is understandable in the frame of reference of higher management. *Flip* chart presentations so many times turn into *flop* charts because the content is not presented with the audience's point of view in mind. Whether it is a formal chart presentation, verbal discussion, or office memorandum, the manager has an idea—something he wants to sell. The presentation should be put into language that *the listener* understands. Many managers present ideas in terms of their own needs and the way *they* look at the situation, instead of communicating the same idea from the listener's point of view, through his problem orientation. Present the proposal and the need in the way the boss understands the need, the way he sees the problem, using his language, using his concepts, and appreciating his human situation. Many an employee has failed in communicating his ideas because he has demonstrated what an expert *he is* at the sake of getting the proposals accepted! There is a higher probability of success in communication if an idea and a proposal are explained as if the presenter of the idea were sitting on the other side of the desk. How does the listener understand things? What are the concepts he uses? What are the words he uses? What are the ideas that he thinks in terms of? Cast the presentation in *that* framework.

- *Supporting Documents.*

Provide supporting documents behind proposal requests. Many a manager and staff man has "dreamed up" a wonderful proposal. However, it is presented with having little of the "homework" behind it, well organized in a separate section. Do not catch the listener cold. Provide him with backup information to assist in his decision making.

On the other hand, don't give the receiving manager an 80-page proposal because he doesn't have time to read it, much less comprehend it. The communicator is better off writing a one- or two-page proposal that is right to the point and calls for actions. To answer the receiver's questions and doubts, provide a packet of supporting back-up information. *Do not be accused of incomplete staff work.* If the communicator does not provide the supporting documents, he is putting the receiving manager at a disadvantage because the receiver doesn't want to admit that he is afraid of the idea, or that he doesn't understand the idea. These are some of the things that may enter the receiver's mind when he sees that cold proposal. However, having lead time and the supporting data leading to logical conclusions and recommendations, the receiver can appear knowledgeable. He can be the expert, not only to *his* boss but to the communicator as well. For the most part, executives want to make decisions. They would like to make a decision on ideas and promote effective action, but if they don't have the back-up information, they are caught short and so is the communicator.

The reaction the communicator usually gets is either indecision or no decision.

The communication itself should be *direct* and to the point—*simple, relevant,* and *request action.* A higher manager wants to know what he is supposed to do with this idea, proposal, or memorandum. If the sender hasn't told him what he wants him to do with it, it is a frustrating piece of paper to the receiver. The sender wants the receiving manager to make a decision. He must, therefore, direct the manager's thinking toward the action request. The information must be relevant to the proposal. Draw the conclusion, request the action, and be direct and simple in the proposal's language.

• *Referral to Higher Management.*

Provide the return-on-investment reasons for immediate management to support the proposal to higher management. Every boss has a boss. This is a striking opportunity for ineptness in communication by subordinates. For the most part, immediate management will have to clear its decision topside. It wants to be put in the posture of being knowledgeable and being an expert to its executive. The communicator does a disservice to his idea, and does a disservice to his boss when he does not, in fact, provide reasons which will be needed to defend the proposal. The proposer of an idea should ask himself, "What does my boss need to know *for his boss*? What is the framework of my boss and how does he communicate to his boss?" As the writer incorporates this sensitivity into his writing, by providing reasons, he is helping the bandwagon move along for idea implementation. Don't sell the proposal short and don't sell immediate management short by not giving the reasons that will be meaningful to his executive.

• *Integrate Information.*

Integrate the information so that the receiver can draw honest and appropriate conclusions. In a sense, a superior is at a disadvantage to the subordinate, as the subordinate is more familiar with the information than he is. The sender has much more in his repertoire of facts and knowledge.

The communicator needs to lead the manager to a conclusion with pointedness and integrity. Lead him to the appropriate conclusions he is being asked to act upon. Many people wander through their presentation in a haphazard, random fashion. After the receiver is through reading or hearing the presentation, the question is, "What did he say? What does he want me to do? What conclusion should I draw?" The communicator is seeking action and the executive may be seeing it as "nice to know" information. The sender has a responsibility in his communication to funnel it toward appropriate and honest conclusions.

Don't play games with communications; the manager must have honest facts and he must come to an honest conclusion. If the sender deludes him and leads him down the primrose path and the executive commits to action, their relationships may be in jeopardy.

• *Alternative Actions.*

Provide alternatives for action when communicating a proposal and estimate the probability of cost consequences in the different alternatives. Provide alternatives for consideration at the same time the executive is considering the main recommendation. Many a man has achieved what he wanted because he built his recommendation on solid, ethical grounds, but he also provided a second alternative to his proposal. Whatever communication media is used, show the possible alternative actions. Let the receiving executive decide that the alternatives are not as good as the main recommendation. If the alternatives are better, at least there is increased probability of turning the proposal into performance. The problem of proposals is inaction! □

CAD-E: A Key to Cost and Time Reduction

Tool of the Future

Distinct changes in the philosophy of defense materiel acquisition, formulated by the Secretary of Defense in early 1969, have placed increasing demands on those agencies responsible for executing policy in this area.

In the July 1972 issue of the *Defense Management Journal*, former Deputy Secretary of Defense David Packard described the basic problems that confronted him when he joined the DOD management team:

Cost overruns were the most visible symptoms of the troubled new weapon development situation but there were other problems, too. Most programs took far too long from original conception until weapons were delivered to the operational military forces. As a result many weapons, particularly those involving electronics and other fast moving technology, were out of date by the time they were available.

To compound the problem, even after exorbitantly high cost and unnecessarily long development time, many of the new devices did not have the reliability that is needed for military use.[1]

The major thrust in reversing these symptoms is to ensure by thorough testing of actual hardware, or prototyping, that we have a producible item meeting performance goals with the appropriate degree of reliability. Under this philosophy, high volume production will be initiated only after success has been achieved in that phase.

In describing how the Army is conforming to these policies, Major General George Sammet, Jr., Deputy Chief of Research and Development for the Army, cited as a goal the reduction in acquisition time span from the current 8–10 years to about six years. He proposed to accomplish this goal largely by reducing documentation, streamlining the decision process and accepting some controlled concurrency

by General Henry A. Miley Jr., USA
Commanding General
U.S. Army Materiel Command

[1] *David Packard, "Improving R&D Management Through Prototyping,"* Defense Management Journal, *July 1972, p. 3.*

where the risk level is low.[2]

CAD-E Program

Another approach to Army's attack on the rising cost of materiel acquisition is application of the scientist/engineer-computer team in increasing intensity to the development and design of materiel. Computer-aided Design and Engineering (CAD–E) is defined within Army as "the application of automated techniques enabling the engineer (or scientist) to accomplish his normal functions in concept, design, and design evaluation." It encompasses the use of computers in:

- Conceptual design.
- Mathematical modeling and design prediction.
- Design preparation and automatic drafting.
- Prototype fabrication.
- Automated simulation and testing.

Army's CAD–E program, as its definition implies, includes the full spectrum of computer applications to materiel development. Within this spectrum there are identifiable capabilities that define the extremes involved in this application. These extremes are graphic vs. non-graphic; conversational vs. non-conversational.

The *graphic* capability of the computer system refers to its ability to display data and information in a pictorial or symbolic form. This capability helps the user to quickly assimilate, evaluate and explain complex situations, problems, or solutions. *Conversational* capability allows the system to accept instructions and guidance from the user and make responses while computations are in progress. Ideally, the time between instruction and response should be short enough for the user to consider it worthwhile to wait for the response and not break his train of thought. The degree to which a computer system combines these capabilities is a measure of its overall utility to the designer/engineer. Representing the extremes of these capabilities, the configuration of four computer systems will now be briefly described.

Graphic, Conversational

Here a man uses a graphic console (usually a cathode ray tube) for input and output actions directly involving the computer. The man gives commands to the computer via a light pen, a keyboard, or a graphic input tablet device while sitting at the graphic console. Emphasis is on pictorial representation and direct interaction with the computer (Figure 1). Pictorial representations produced on the graphic console include all forms of geometry having physical or mathematical properties, and those forms of geometry which are symbolic (tables, bar charts, etc.). The conversational aspects of the configuration may be either language statements presented to the computer by keyboard, or user actions directly conveyed to the computer via light pen or other direct means.

As indicated, the term "conversational" implies the computer is available to respond to the user's command in a time period that is comfortable to him, and does not interrupt his thought processes. This conversational capability of a computer would appear to require

Figure 1
Graphic console used to design ballistic projectile.

[2] *Major General George Sammet Jr., USA, "Army Prototyping Philosophy: Improve the Acquisition Process,"* Defense Management Journal, *July 1972, p. 10.*

dedication to one user of the full capability of a computer of sufficient capacity to accommodate his needs. Fortunately, a technique known as "time sharing" makes it possible for a central computer to serve several user terminals operating simultaneously. This is accomplished by taking advantage of the computer's rapidity to manipulate data as compared with the longer time required for the user to input commands or data to the computer. In a time sharing mode, the computer is programmed to devote a fraction of a minute or so to each user in a "round robin" method. As this technique is improved, it will permit increasingly efficient use of relatively expensive computer capacity.

Non-Graphic, Conversational

This capability is similar to the graphic, conversational configuration in that the computer will respond to the user's commands in a suitable time period without interrupting the user's thought processes. The input/output devices used, however, are alphanumeric rather than graphic terminals. These range from simple teletypewriters to typewriter/lineprinter combinations, including non-graphic cathode ray tube terminals.

Non-Graphic, Non-Conversational

The term "non-conversational" implies that a computing problem is run from beginning to end without breaking computation into steps involving man intervention or man/machine communication. This particular technique is nominally referred to as "batch processing" and is the way most engineers, designers and scientists use computers today.

Data for a particular problem solution is submitted in an alphanumeric form to the computer directly or remotely. The response is given in alphanumeric form and takes such an amount of time that the individual user's thought processes are interrupted, perhaps for as long as several hours or several days. This is normally not due to the time it takes the computer to perform its function (which is generally only a few seconds or minutes), but to the time it takes to actually get the job to the computer. This time is heavily influenced by jobs waiting in a queue and by manual procedures which must be accomplished first, such as keypunching. This total elapsed time—from when the job is submitted until the answer or response is available—is called "turnaround time." It is the difference in turnaround time from that of a few seconds or minutes to that of hours or days that best distinguishes conversational from non-conversational computing.

Graphic, Non-Conversational

This technique is the same as in the non-graphic, non-conversational, except that graphic rather than alphanumeric input/output devices are employed. They are considered auxiliary devices and are not necessarily attached directly to the computer system as in the case of the graphic, conversational technique. Hence, the user is not conversational with the computer but is only introducing input data or receiving output data in graphic form. In this case, graphic implication has more to do with the presentation of data than with the design process itself. The auxiliary devices commonly used for this process are digitizers for input and plotters for output. This technique is often referred to as "graphic batch." [3]

CAD-E Potential

Permitting the engineer/scientist to interact, or converse, directly with the computer has produced a combination of man and machine that can potentially far outproduce either man or machine operating separately. It is this conversational (interactive) aspect that appears to offer the most promising potential within CAD–E. At the Department of Defense Industry Symposium, Computer aided Design/Computer Aided Manufacturing/Numerical Control in 1969, this subject was discussed:

[*This interactive process*] *represents a revolutionary step in improving the productivity and, eventually, the creativity of man . . . . It enables the designer to quickly select materials, processes, and techniques from libraries of data by selecting parameters such as cost, speed, heat resistance, weight, maximum sizes and minimum strengths. It enables him to model the performance of a device or process . . . for human analysis or for input to a subsequent stage of modeling. Of particular importance, is the ability to visually present com-*

[3] *Adapted from "Proceedings of the Department of Defense Industry Symposium," October 1969, Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, pp. 3 and 4.*

plex data and [to alter] model parameters . . . the computers capability for storing and recalling large amounts of data frees man of what, for him, has become an almost impossible task.

Such interaction between the designer and computer can most meaningfully increase the quantity and quality of the output of the designer. It can also reduce the cost of design, reduce the prime delay and decision time and increase the production of superior designs and equipment. Perhaps most important of all, it will have an impact on the productivity of scarce human resources. This is especially true in design, which is an intricate process and depends on the knowledge and creativity of the man to choose directions and make decisions. . . .[4]

Economic Aspects

At the same symposium, the economic aspects of CAD–E; *i.e.*, expected pay-offs, were explored in some depth by Study Panel One. The panel reported that:

. . . the justification of costs associated with CAD, are not yet as fully developed as most managers and CAD practitioners would like. The costs . . . involve development and acquisition of equipment, programming investment, training cost, and operating cost. The returns are in the form of manhour savings in the highly skilled engineering design activity . . . and more rapid response throughout the engineering and manufacturing cycle. Those factors . . . directly related to material costs and . . . salaries are . . . comparable. The value that can normally not be assessed is absolute time; the value of having a development this year rather than next, or the value of reducing the lead time on a complex design from one year to six months.[5]

The panel estimated that employment of CAD–E technology *"will conservatively reduce the cost of product development by as much as 50%."* [6]

A commercial corporation, which has been using an interactive graphic CAD system—title DAC–I—since 1965, has realized a 5 to 1 reduction in lead time, primarily through the increase in productivity of scarce design manpower. The division of a second corporation estimated cost reductions of up to 50 percent, based on realized savings of 10 percent to 30 percent. Both organizations experienced similar time savings.

Improved Data

The technical data package (TDP) is the end product of the materiel development phase. The quality of the TDP is measured in terms of fidelity to the form, fit and function of the approved prototype, producibility, completeness and freedom from error. This quality is reflected in the extent to which cost growth is avoided during the initial production and early deployment. CAD–E techniques have increased the quality of TDPs in several aspects.

The Technical Data/Configuration Management System (TD/CMS) is a large-scale, computer-based engineering information system being effected by the Army Materiel Command (AMC). The objective of this continuing effort is to provide the means of controlling, storing, interrelating and rapidly retrieving massive quantities of configuration management and engineering data, and rapidly identifying TDPs for procurement.

At the Army Tank-Automotive Command, where this system is already in being, it has shortened administrative lead time required for preparation of TDPs from 24 days in FY 1970 to about four days at the end of FY 1972. A further reduction to two days is anticipated by the end of FY 1973. Accuracy and completeness have also improved. Computer-guided automatic drafting machines and high-speed printers can rapidly turn out detailed drawings and specifications, drawing on data stored in computer memory or on magnetic or perforated tape. Elimination of the human element from such data-transfer processes greatly increases the accuracy of the final document.

Precision is likewise improved by the use of CAD–E devices such as the three-dimensional manual digitizer. The Army Electronics Command is using such an instrument—the PICOMM Coordinate Measuring Instrument (Figure 2). This instrument, by "feeling" an irregular object at critical points on its surface (its sensor is manually positioned on the critical points), can generate digital data representing the shape of the object to a precision of 0.0002 inches. This digitizer is connected to a TRIDEA Graphic System (Figure 3) capable of producing scale drawings of the object. This system can generate

[4] *"Proceedings of the Department of Defense Industry Symposium," October 1969, Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, pp. 3 and 4.*
[5] *Ibid., p. 5.*
[6] *Ibid., p. 6.*

Figure 2
Three-dimensional digitizer.

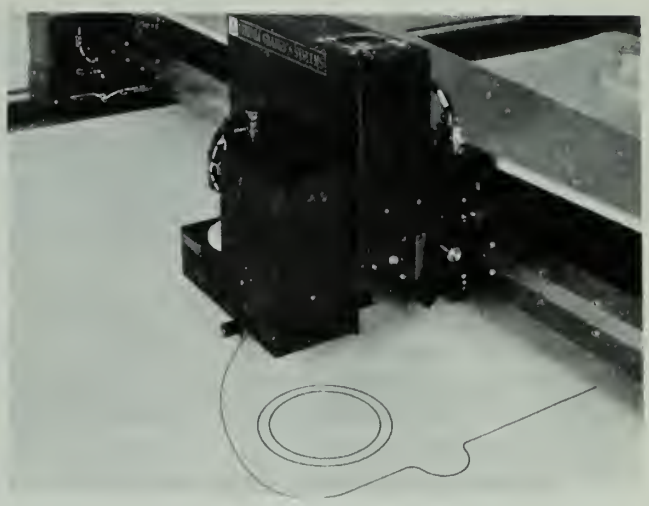


Figure 3
TRIDEA graphic system.

magnetic or perforated paper tape which, in turn, can guide a numerically controlled (NC) metal working machine to reproduce the object as hardware.

CAD–E techniques such as these which take advantage of the computer's capability to receive, manipulate, store and retrieve large amounts of data quickly and accurately, are improving the quality of Army technical data packages. Efforts are continuing to broaden the applications of CAD–E at this crucial point in the materiel life cycle—the juncture where development gives way to production.

CAD-E Council

AMC is currently involved in an intensive CAD–E program. In October 1969, AMC announced the establishment of the CAD–E Council. The functions of this council, chaired by a general officer, include guidance for interchange of information within the Army Materiel Command, the Military Services, other Government agencies, industry and the academic community. The council also guides Army representation on the Department of Defense Tri-Service Ad Hoc Committee on Interactive Graphics. Working groups from AMC's major subordinate commands, arsenals and laboratories deal with exploitation of computer-aided design in specific task areas.

The council recognized early that if AMC's CAD–E Program is to be successful, education and training of managers, scientists and engineers is a prime need. A working group was established to address this need and recommended an educational program of instruction. Under this program, selected young AMC engineers are now attending a 12-month course at the University of Michigan that will lead to a master's degree in computer sciences. In a cooperative effort, AMC has assisted the U.S. Military Academy in augmenting its interactive graphics equipment; the Military Academy staff provided a series of four graduate-level seminars for AMC executives last summer. Major General Stewart C. Meyer, AMC Director of Research, Development and Engineering and chairman of the CAD–E Council, emphasizes the importance of "grass roots" training programs conducted at the commodity command or laboratory level. "They permit the training of larger numbers of key personnel. . . . Additionally, the local program can be oriented toward problems peculiar to that command or laboratory." [7]

Use of CAD-E in AMC

The heart of AMCs CAD–E Program is a 5-year plan designed to speed development within its major subordinate commands, laboratories and arsenals, of the CAD–E technology and techniques yielding the most effective long-term benefits to the design process. The plan arose from analyzing various phases of the design and engineering process and determining elements of computer technology applicable to these design phases. The next step was devel-

[7] *Major General Stewart C. Meyer, USA, Presentation at the Ninth Meeting, USAMC Computer-Aided Design and Engineering Council at Rock Island, Ill., July 26, 1972.*

oping projects that would achieve the end result of infusing technology into the AMC design process. The 5-year program includes approximately 100 separate R&D work units, selected by the CAD–E Council from about 300 proposals submitted by AMC subordinate commands. During these five years, it is expected that CAD–E will improve and reduce the cost of AMC design and engineering activities, thus encouraging continued use and development of CAD–E without further subsidiary funding.

Historically, we have designed and engineered our hardware by the cut and try method. Make one or two, test them until they fail, design and fabricate fixes, test and fabricate another batch, test again, and hopefully arrive at a design which comes close to the original requirement—a lengthy and costly procedure. Increased use of CAD–E technology can improve on this empirical system.

Results Achieved

Three applications of the use of CAD–E by AMC are illustrating favorable results to date.

First, at the Army Electronics Command (ECOM) use of CAD–E techniques has made possible the design and fabrication of a small microwave integrated circuit which replaces a large travelling wave tube (Figure 4). The computer-designed integrated circuit is a very significant improvement in weight, volume, power and reliability—at lower cost—in equipment such as wide-band receivers for electronic warfare and radar applications.

Design of microwave integrated circuits requires the solution of a problem involving from 24 to 36 independent variables. The required mathematical computations are so complex that use of a computer is a basic necessity. But even with the aid of a computer for calculations, the time required of 3 to 6 months is still excessively long. In response, ECOM developed a computer program called DEMON (Diminishing Error Method of Optimization for Networks). DEMON is a highly advanced computer program for the design of microwave integrated circuits. The DEMON program is capable of solving up to 110 variables and searching for optimum solution of over 55 frequency points. Total circuit design time required is now 2 to 3 minutes instead of 3 to 6 months.

Figure 4
Microwave integrated circuit.

Performance advantages of the computer-designed circuit are every bit as dramatic as the visual comparison in Figure 4 indicates. While size and weight are reduced by factors of 100 and 40, respectively, power demand is reduced by an even greater amount. Furthermore, cost is cut in half. Another significant impact for Army applications is longer life of the computer model—25 times greater than the circuit designed by using older techniques. These advantages now make feasible the use of hundreds of thousands of these computer-designed devices for large Army phased-array radars.

Second, the 2.75-inch rocket system is installed on the AH–1G Cobra helicopter (Figure 5). The rocket system had, in its inventory of warheads, separate anti-personnel and anti-tank rounds. The anti-tank warhead was of Korean War vintage.

A product improvement pro-

Figure 5
Cobra fires 2.75-inch rockets.

Figure 6
Squad automatic weapon.

gram was authorized in April 1971 to develop a dual purpose warhead (anti-tank/anti-personnel) for the system. A fusing system for the warhead was designed using CAD–E models and techniques. In early April 1972, U.S. Army Vietnam (USARV) submitted an urgent request for anti-tank weapons. AMC deployed the improved rounds to Southeast Asia in mid-April. Reports received from USARV aviation units indicated high user enthusiasm, crediting at least three tank kills to the system between April 15 and May 11. No malfunctions have been reported to date. Using CAD–E techniques, the fusing system was designed and fielded in a little over a year, whereas developments of similar complexity not using CAD–E have traditionally required up to three years. It is unlikely the round would have been available to meet the urgent request of USARV without CAD–E.

Third, a CAD–E technique, Parametric Design Analysis (PDA), was used to identify optimum system characteristics for the Squad Automatic Weapon (SAW) (Figure 6). Using materiel need requirements and about 1,000 defense system concepts as inputs, PDA selected optimum defense system characteristics. The use of CAD–E made possible evaluation of a much larger number of concepts, thus increasing confidence in the result. CAD–E did it with 25 percent fewer people and reduced the required time to perform an analysis of equal scope from about a month to a matter of minutes. It reduced design time for the initial firing fixture (device to permit study of weapon/ammunition interface) from 18 to 12 months. The excellent performance of this CAD–E designed firing fixture has significantly reduced the redesign effort that will be required for the prototype. A savings of $300,000 has been realized so far with more expected. Reliability and maintainability have also improved.

Tool of the Future

CAD–E is here to stay. Designers, engineers and technical managers in today's tight-resources environment will do well to familiarize themselves with this tool and adapt it to their needs. Those who fail to do so run a good chance of finding themselves well behind the "power curve."

A recent speaker at the CAD–E Seminar at West Point summed it up this way: "It is expected that CAD–E will become the way of life in the same manner that the slide rule, desk calculator, and other current engineering aids have. . . . It will become so woven into the cloth of our existence that no conscious stimulus will be required to use CAD–E. It will be the routine rather than the exception."[8]

Project and product managers, faced with the ever-present challenge to do more with less, cannot afford to ignore the current and potential benefits offered by CAD–E. □

[8] *Colonel Joseph E. Fix III, Presentation to CAD-E Executive Seminar at West Point, New York, August 7, 1972.*

A Proposal: Improving Operational Systems by Experimental Prototyping

Research and development does not, nor should it, stop when a defense weapon system goes into the operational inventory. While sometimes called by other terms (and funded from other appropriations), R&D has always continued throughout the life of defense systems. Problems arise and are solved. Opportunities to upgrade performance are made possible by technological advances and changes occur in deployed systems as missions and threats change.

The continuing research, development, test and evaluation (RDT&E) of operating systems should properly be directed toward quite different objectives than those sought in earlier conceptual and development stages. Reliability and life-cycle cost receive some attention (and much lip service) but absolute performance, such as top-speed, range, firepower, etc., are the primary objectives which shape RDT&E effort in the early stages of defense system development.

In RDT&E on operating systems, improving systems effectiveness and reducing cost should be primary objectives, and thus shape the RDT&E effort applied. The term "systems effectiveness" is used here to denote how well a defense weapon system works when it *does* work and what percentage of the time it does work at all, under actual operating conditions.

The key element in raising the level of systems effectiveness is improvement of reliability. Reliability improvement is also one of the major means for reducing costs of operation and maintenance (O&M) of weapons in the operating inventory. The problem of reliability, and the proven approach to its solution, was discussed by David Packard, former Deputy Secretary of Defense, in the July 1972 issue of the *Defense Management Journal* this way:

"[A] serious problem that troubles all of our recent major programs is reliability. Numerous directives, specifications, and other requirements have been placed on all major development programs to attempt to improve the reliability of new weapons. Very little improvement, if any, has come from this effort and very large sums of money have been spent.

"Reliability cannot be achieved by adhering to detailed specifications. Reliability cannot be achieved by formula or by analysis. Some of these may help to some extent but *there is only one road to reliability. Build it, test it, and fix the things that go wrong. Repeat the process until the desired reliability is achieved. It is a feedback process and there is no other way.*" (Italics added).

It is anticipated the increased emphasis on testing and evaluation will result in higher reliability for future operating systems. The relia-

by Dr. Robert J. Massey
President
Progress Management Services

Opinions expressed herein are those of the author and not necessarily those of the Department of Defense.

bility problem will never be totally *solved* before new weapons enter the inventory. Many of the problems whose solution will improve reliability will not reveal themselves until after the system has operated in the operational environment for a considerable period.

Proposed Approach

The function of improving systems effectiveness and minimizing O&M cost can be accomplished with efficiency never achieved in past programs through application of a version of "experimental prototyping."

In its conventional application, experimental prototyping is designed to determine, through realistic tests and evaluation, the efficacy of new concepts and ideas. The fundamental precepts of experimental prototyping are first hardware, not studies, and second, tests, not analyses. Under this approach, selected contractors produce hardware, working under general performance goals and with minimum documentation and external management control. Such prototypes are normally tested under operational conditions.[1]

If experimental prototyping were applied to upgrading operational systems, the approach would use actual deployed units of system hardware for the next major modification of that system.

Single units of an operating defense system, such as an air-to-air missile, a tank, or a shipboard radar, would be turned over to several competing "prototyping teams" funded through fixed price contracts to the organizations providing them.

The teams would be responsible for both current maintenance of the defense system and for research, development, test and evaluation of innovations to improve its effectiveness and reduce costs. The teams, together with their supporting contractors, would "breadboard" various innovations and try them out in the course of normal operations of the units to which their piece of equipment was assigned. Innovations whose worth was thus demonstrated would be considered for full-scale development and/or general use.

Prototyping Teams

The teams, which would be physically based with the operating units to which their piece of hardware was assigned, would be small. The team for a shipboard air-search radar might be limited to an average of three men, two of which would be semipermanent cadre members with the third man-year accounted for by experts called in on an *ad hoc* basis as their specialized expertise was required. The cadre team members would be "semipermanent" in that they would enjoy the same job security that a professional football player has. They would stay with the team as long as they were able to outperform any competitor.

The number of teams working on upgrading a particular system or equipment would range from a minimum of three to a number limited only by the number of contractors with an all-around capability in the technology of the system. Minimum competition would include one team from the contractor providing the equipment, one in-house DOD team and one from a competing contractor. Additional industry teams might be supported as a means of preserving and upgrading the innovative capabilities of contractors as a key element in the Nation's technology base.

The in-house DOD team would further advance the base of DOD expertise required to select from among demonstrated innovations those to be further developed and/or incorporated in subsequent modification of a defense system.

While the prototyping teams would provide the skills required to upgrade the maintenance and support system and the actual system hardware, all actual maintenance direct labor would be performed by regularly assigned military personnel. Further, the bulk of spare parts and other supplies used to maintain the weapon system would be provided from the regular supply system.

Contractual Arrangements

The competing experimental prototyping teams would be funded under fixed-price, level-of-effort contracts. Firm rules and effective

[1] *U.S. Congress, Senate Committee on Armed Services, Hearings, "Advanced Prototype," 92nd Congress, 1st Session, Sept. 9, 1971. See also the series of articles on prototyping in* Defense Management Journal, *July 1972.*

controls would have to be established to prevent "buying in."

Contracts would be continuous unless terminated. From time to time, marginal teams might be dropped. In such cases, the contract would enter the terminal phase during which the contractor would restore or convert the hardware to its current standard configuration.

Since the contracts would cover both maintenance of the operating system and experimental effort to improve it, the total value of the contract would be set at some level above the Government's cost of the system's maintenance and operation when considered on a fully allocated basis.

Fixed Contract Value

Figure 1 illustrates the division of the fixed contract value among these elements: team costs, consisting of direct labor, overhead, and travel; payment back to the Government for manpower and material from the logistic system; RDT&E effort to develop and demonstrate system improvements; and contractor fee or profit.

It should be noted the total cost of the contract is not all out-of-pocket cost to the Government. Initially probably well over half the total contract price would go back to the Government in payment for labor and material support. For example, a total contract might be $2 million a year to maintain and upgrade an operating system. Direct labor, overhead and travel for the prototyping team might cost $300,000. At the start of the effort perhaps $1.5 of the remaining $1.7 million might go back to the Government as the fully allocated cost of military manpower and material provided by the Government, thus leaving only $200,000 to support R&D effort and to provide for the contractor's fee.

The prices charged the contractor by the Government for maintenance manpower and supply system support would include a "markup" reflecting the best estimate of the true cost of making such resources available in operating units. In most cases, the markup would probably be several hundred percent as realistic allowances are made for the full cost of operating military organizations, training, logistically supporting and pensioning the military manpower, etc. For example, services of a skilled E–6 electronics technician with specialized

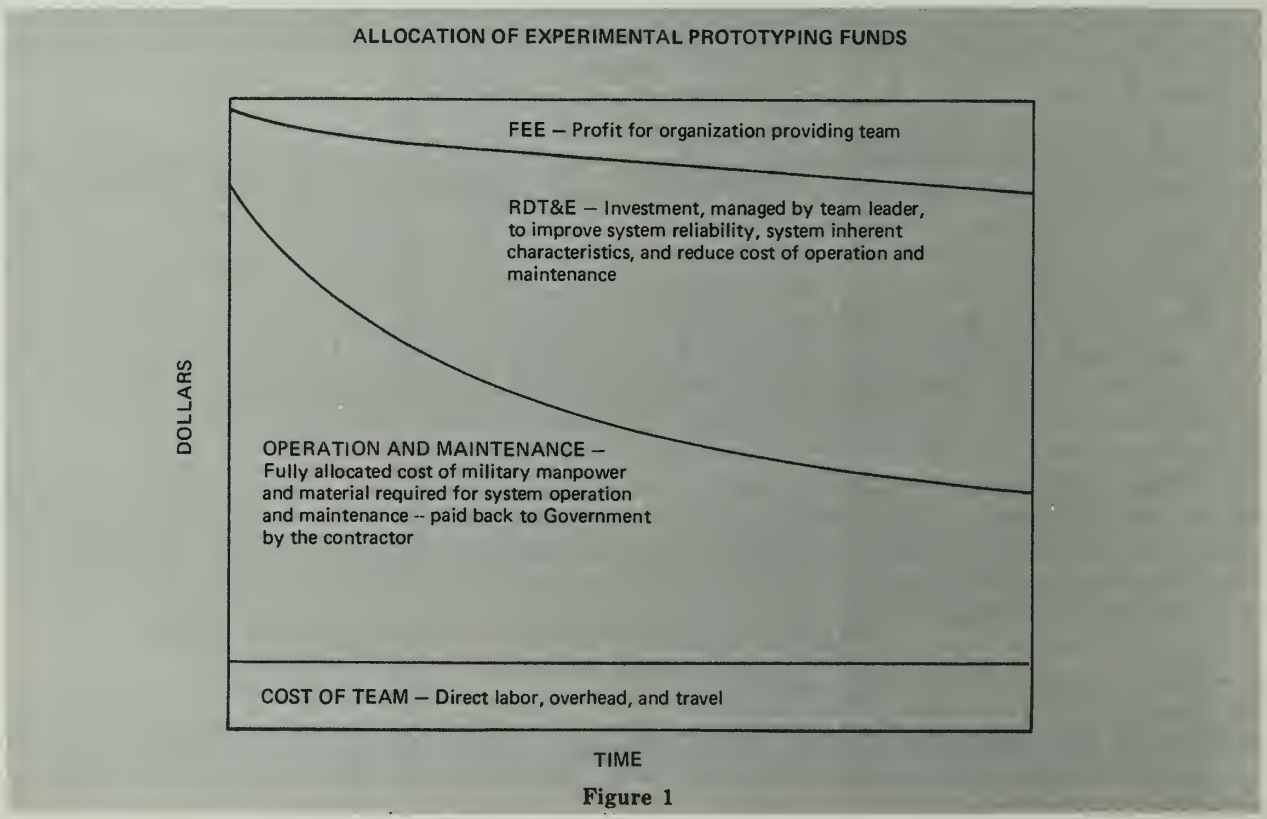


Figure 1

schooling and seven years experience might be billed to the contractor at $60 per hour for work he performs to support a prototyping team.

Since the total cost of the contract is fixed, and since it covers both system support and RDT&E, the contractor could increase the amount available for RDT&E by successfully reducing operation and maintenance (O&M) costs. If the team succeeded in reducing O&M costs by 50 percent, that would increase the amount available for RDT&E and profit from $200,000 to $950,000—a real incentive to reduce costs.

Requirements and Constraints

The effort would be conducted without formally stated requirements in the conventional sense. The Government would have, however, advised the competing teams of the performance parameters considered important and their relative weights.

Technical, financial, contracting and managerial authority would be delegated to the team leader to the ultimate extent. The team leader's only "boss" would literally be the logical necessities of the job to be done. The rules of the experiment would forbid virtually all reporting, including reporting by the team leader to his own organization, and all layering.

The team leader would have virtually unlimited technical discretion. For the experiment, all specifications, standards, procedures, etc., *except for those directly based on mandatory law*, would be waived. He could make any changes to any aspect of the hardware or software of the total system that he thought appropriate.

The team leader would have total discretion to allocate the resources available to him in whatever manner he thought best. Further, this authority would be backed by contracting authority. While most of the team leader's contracts would be with his parent organization, he would be free to hire consultants wherever available, and to contract with any organization, including government laboratories.

One constraint on the autonomy of the team leader would be a requirement, probably backed by a bond, that the organization providing the team be able to restore the system hardware to standard configuration for a specified fee. Another constraint of sorts would be that the team would be with an operating unit by invitation of the commanding officer—an invitation revokable for cause, *e.g.*, for drinking aboard ship.

Of course, penalties would be invoked if the operational performance of the equipment assigned to a prototyping team fell below the average for all such units in the operating forces. In case of such failure, the Government might withhold the "rent," invoke some other financial penalty, terminate the contract, or take other appropriate action.

Total Innovation on Total System

The framework of competitive, experimental prototyping provides maximum freedom to pursue those innovations having the highest impact on performance and cost of the total system. Problems could be solved through a subsystem, or mix of subsystems, where results could be achieved at the lowest cost.

All elements of the total system contributing to capability and cost would be proper subjects for innovation by the prototyping team. These include:

- *Operating Procedures.* Through modifications of operating procedures it is often more cost effective to live with some deficiency, rather than redesign hardware.
- *Supply System.* Substantial economies may be achieved through changes in requirements for stocking of spares in operating units, at depots, etc. Other supply system innovations might include substitution of readily available low-cost inventory parts for parts specified by the system manufacturer if, in the technical judgment of the team leader, lower-cost common parts would provide the required performance.
- *Personnel Requirements.* The team leader would be free to vary the number and mix of personnel in the system manning requirements.
- *Maintenance Procedures and Doctrine.* Maintenance procedures and doctrine have high leverage in determining the cost of owning and operating a system. Through effort in this area it may be possible to substantially improve reliability while actually cutting maintenance costs. The possibilities for innovation in this

area are almost unlimited.

• *System Hardware.* The team would have the opportunity to make changes in system hardware, ranging from the most minor to the prototyping of entirely redesigned major subsystems. One of the highest leverage advantages of the prototyping approach to upgrading operating systems would be the ability to exploit very minor changes which, while individually modest in their impact, provide a very high "return on investment" of the time and talent required to make them. Under the present system, most such minor changes are not practical due to the extremely high administrative overhead cost of obtaining the necessary authority.

Evaluation of Competition

While the competing teams develop and test innovations, the Government would provide rigorous and continuous measurement of actual achieved system performance and operation and maintenance (O&M) costs. These measurements would also be made for "controls," *i.e.*, systems typical of the operating population. The controls provide a standard or yardstick for judging the results achieved by the prototyping teams.

Experimental prototype contracts to upgrade operational systems would have a fixed "disclosure date," the equivalent of a delivery date for most contracts. During the competition, each team would be prototyping improved versions of parts, components and subsystems, and developing other innovations. These innovations would be tested, modified and retested in the course of normal operations.

On the disclosure date, each team would be required to:

• Identify innovations which had been made to the system.

• Assign to each innovation an appropriate weight in terms of its contribution to the improvement in the effectiveness and reduction of O&M cost which had been achieved.

Establishing Requirements

Under the terms of the contracts, the Government would have full rights to the use of any inventions demonstrated during the course of the effort.

As a general rule the competitive experimental prototyping effort would be continuous. Periodic disclosure would occur at scheduled intervals. *After* demonstration of improved effeciveness and/or reduced O&M costs, and disclosure how these results were achieved, decisions by the Government would be made concerning possible exploitation of these innovations. Requirements for full-scale development of hardware demonstrated in prototype, and for implementing selected innovations in all operating units, would be promulgated from time to time.

Performance Incentives

Why should we expect industry to go along with such a program at all, let alone assign their most productive people to the prototyping teams?

To be sure, the program would probably be very unpopular with contractors who have won production contracts. They could not be expected to view with enthusiasm having some of their first production items turned over to their competitor's best technical people who would shortly achieve an understanding of the system approaching that of its developer, plus a much more powerful incentive to be innovative in improving reliability and cutting costs.

While the "haves" might see the proposed program as a threat, the advantages to the rest of the industry would dictate participation and assigning their most productive people to the teams.

Some of the incentives are:

• Sheer survival of their technical capability. Participation in the prototyping teams would provide a means to support their cadre and preserve the "seeds" of technical capability to meet future needs.

• Opportunity for their best technical people to gain a superior knowledge of real operating requirements and environment which will make them more effective competitors in any future development competitions.

• Opportunity to make a profit. The profit earned directly by the prototyping team would be relatively insignificant compared to other profit opportunities.

Potential profitable activities include:

• Providing spare parts.

• Training Government personnel in superior maintenance procedures which its team had developed.

• Providing tools, support equipment, etc.

• Full-scale development of superior subsystems demonstrated in prototype.

• Providing subsystems as Government-furnished equipment (GFE) for future production and retrofit.

• Remanufacture of the entire inventory to convert the system to a new modification.

• Manufacturing the system through winning a second source or follow-on production contract.

Advantages of Proposed Approach

The task of improving effectiveness and reducing cost of defense weapon systems already in the operating inventory can be accomplished in an all-around superior manner through adaptation of the competitive experimental prototyping approach. The proposed approach is designed to satisfy these objectives:

• Apply top technical talent to direct technical effort.

• Free this talent for productive effort by reducing to the barest minimum time-sapping demands related to reporting, reviewing, layering, etc.

• Provide the team leader virtually unlimited technical authority to innovate, with overall financial resources as the only really significant constraint.

• Provide an incentive for the prototyping team to strive to maximize operational effectiveness and system reliability and to minimize life-cycle costs.

• Provide through face-to-face communications maximum understanding between operational needs and constraints and scientific and technical possibilities.

• Provide realistic demonstrations of proposed system modifications, not merely prior to the production/deployment decision, but *prior to the full-scale development decision.*

• Provide a framework for "total system innovation" in which total system trade-offs—employment doctrine, operating procedures, maintenance procedures, logistic support, system hardware, etc.—come naturally and changes can be made in that subsystem where useful results can best be achieved.

• Provide the shortest possible time cycle between the first recognition of problems and the operational demonstration of solutions.

• Minimize the time required to achieve potential operational effectiveness and minimum O&M cost for new weapons.

• Provide closed-loop accountability where rewards are based only on demonstrated performance.

This approach to upgrading operating systems sounds promising. But can it deliver? Will it produce side effects worse than the problems it will solve? These questions can be definitively answered only through actual experimental implementation. To verify its potential and develop knowledge needed for its full-scale implementation, the concept of competitive experimental prototyping of operating systems itself needs to be "prototyped" and tested experimentally on a limited scale. □

A man with his heart in his profession imagines and finds resources where the worthless and lazy despair.

—Fredrick the Great: Instructions for his Generals, 1747

The Art of Decision Avoidance: Management Practices Explained

Why make a decision if you don't want to? Or why not postpone a decision until a later date? You shouldn't have to make a decision if you feel that it will put you in a bind or makes you stretch your neck out, only later to find that you will be in hot water. Can you duck an issue?

Non-decision making can be called an art, or it may be played as a game between yourself and the rest of the employees of the organization. You are the dealer, and if you play your cards right, you can bypass many different approaches that may be used in decision making. There is no set way of avoiding decisions. Decision avoidance varies from culture to culture, from individual to individual, and from organization to organization. The primary factor in non-decision making or decision avoidance is the desire to avoid decisions.[1] This article attempts to increase the awareness of the decision avoidance syndrome and how it is practiced in management.

Motivation for avoiding decisions comes from the fear of being wrong or turned down; being a non-decider is safe and secure. Managers avoid decision making by drawing on their past experiences, and putting off the decision in the hopes that someone else will decide or the problem will solve itself. Joseph B. Cooper, author of "The Art of Decision Making," points out why people avoid decisions. The central problem is one of insecurity on the part of decision makers. The decision maker may fear the unknown, he may fear failure, or he may fear the consequences of having taken an action. [2]

Then there are some managers who fail as managers because making up their minds is torture to them. They have something close to physical fear as the time for that final tough choice approaches and will twist and turn and accept any temporary expedient that will give them a little more postponement. [3] Some psychologists explain the rationale of avoidance with approach-avoidance conflict. Clifford T. Morgan and Richard A. King state: "When an individual is attracted to a positive goal and this goal has a fear or threat (negative goal)

[1] *Webster's Dictionary defines decision as, "the act of deciding or settling a dispute or question by giving a judgment, the act of making up one's mind;" while art is defined as "human ability to make things, creativeness, skill;" and avoidance is defined as "away from." "Webster's New World Dictionary, College Edition," The World Publishing Co., 1966, p. 380.*

[2] *Carney, David, "Decisions, Decisions, Decisions,"* Printer's Ink, *Aug. 24, 1962, p. 66.*

[3] *Cooper, Joseph D., "The Art of Decision-Making," (New York, 1961), p. 66-7.*

by Dr. Jitendra M. Sharma
Assoc. Prof. of Business
Northern Michigan University

and

Dr. George R. Carnahan
Assoc. Prof. of Management & Marketing
Northern Michigan University

Opinions expressed herein are those of the authors and not necessarily those of the Department of Defense.

associated with it, then the individual has an approach-avoidance conflict." [4] Applying this to non-decision making, an individual who wants to make a decision, and feels he should, runs into difficulty because of a fear or threat which accompanies the decision. He thus finds conflict in making decisions and, consequently, he avoids them. (It should be noted that "the normal reaction to an approach-avoidance conflict is indecision, vacillation, and compromise.")[5]

Decision Delaying vs Decision Avoiding

Some people confuse decision delaying with the art of decision avoidance. Delaying a decision is a passive activity. A passive manager may employ a number of passive tactics, such as putting the problem at the bottom of his work pile, pretending to be too busy, hiding from the matter, taking a business trip, or, if all else fails, falling sick.

On the other hand, decision avoidance is an active and lively art. A truly effective non-decider will avoid the decision for as long as possible.

An analysis of the decision avoidance model (Figure 1) gives us further understanding of the decision avoidance process. The "Stimulus Situation" refers to the problem itself. This is the actual problem that stimulates, or starts, the decision-making process. The "Conception or Model of the Decision" is the first realization of the need for a decision. It includes the understanding or partial understanding of the "Stimulus Situation." The manager has now conceived the problem and realizes the decision process. He has three choices: make, avoid, or delay the decision. Delaying decisions is a modified form of avoiding decisions. If he must delay, he will eventually face the decision. But if he can avoid the decision entirely, he has reached his ultimate goal.

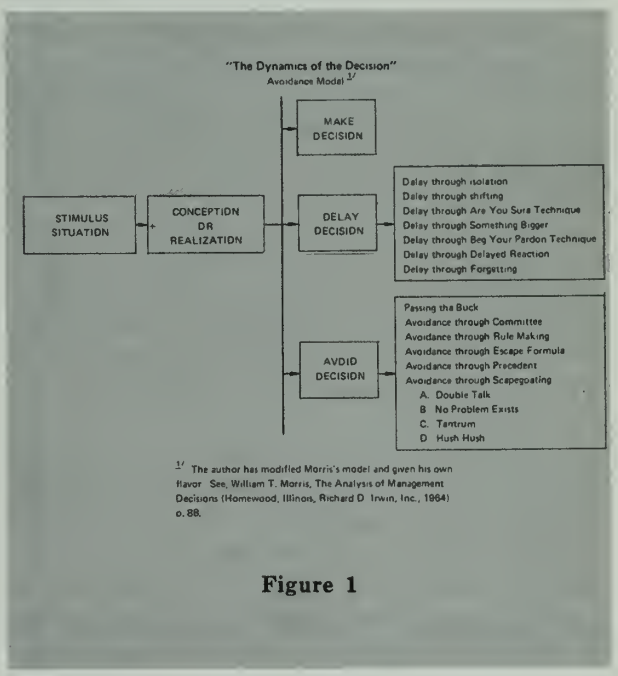
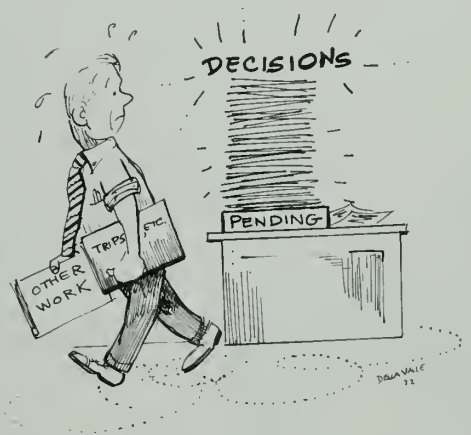


Figure 1



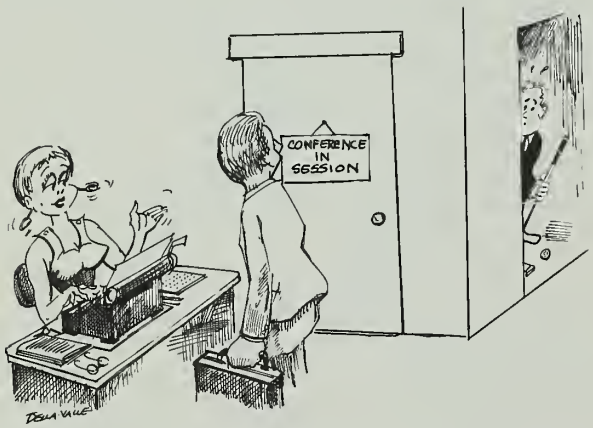
[4] *Morgan, Clifford T., and King, Richard A., "Introduction to Psychology," (New York, 1966), p. 470.*

[5] *Kimble, Gregory A., and Garmezy, Norman, "Principles of General Psychology," (New York, 1963), p. 486.*

Ways To Delay a Decision

Delay through Isolation. [6] When faced with a critical problem that needs attention, the manager may find it most convenient to be "out in the field or on urgent business." If he cannot find a reason to be out on urgent business, then a barrage of secretaries will be thrown out to create a barricade. The man in isolation is like a man in a kitchen that is too hot—he gets out. The only error in this is that the problem won't disappear; it will boil up all the more.

If the employee wants an appointment, have your secretary advise him to fill out an appointment form. The appointment form should provide space for a "reason for visit" line. One of the simplest ways is to avoid seeing the employee. Advise your secretary you are not to be disturbed. Explain to her that you have some important matters to attend to that require complete concentration. This forces the employee to see you when and where you really want to see him. You control the meeting now and can wait for as long as you want or until you are prepared for the meeting. By avoiding the employee and having him wait, he may forget the problem entirely. Keep postponing the employee's appointments. Have your secretary say that you had an unexpected situation arise that needs your immediate attention.



[6] *Douglas, Thomas W., "The Anatomy of Escape,"* SAM Advanced Management Journal, *January 1970, p. 44-46.*

[7] *Rangemekar, Sharu S., "The Art of Avoiding Decisions,"* Management Review, *July 1969, p. 67 condensed from the* Columbia Journal of World Business, *April 1969.*

[8] *Keppner, Otto, "The Art of Non-Decision Making,"* Sales Management, *April 15, 1966, p. 71.*

Delay through Shifting. To accomplish this, show that you are obtaining the advice of experts in that particular field, or you have passed the problem on to higher management, or you are examining the practices of others, or you are persuading others to look into the matter at hand as it is applied by others. In any event, the decision will be slow in coming.

Examining the practices of others is a sure way to create confusion and to aid in delaying making a decision. This helps to persuade others to look into the matter at hand as it is applied to other organizations causing delay and possible avoidance of the decision altogether.[7]

Delay through "Are You Sure?" This technique is most useful when the manager wants to remove 100 percent of the risk of making the decision. In this technique, the manager is trying to delay the decision so he questions the initiator of the proposal whether or not some facts or possible alternatives have been overlooked. These types of questions would almost require that the project be gone over again and again. This easily frustrates the initiator. The end result is a tremendous delay or dropping of the proposal.

Delay through Something Bigger. In this situation, the decision maker complicates the issue by using the excuse that it is a part of a broader program, and that it is necessary to see if this plan fits into the major project. [8]

If a report has been turned in for a project, the non-decision maker could say that he has studied the matter thoroughly, and the proposed project is only a part of a larger program which has been under consideration for a long time. A very simple answer would be that we should wait and see if the new plan would fit into the major project. This would be a way of putting the new plan aside without more discussion. The result would be no decision.

Delay through "Beg Pardon." The "Beg Pardon" technique requires a good sense of timing. This technique works best when the non-decision maker is listening to someone presenting an idea orally. The non-decision maker listens to all the discussions concerning the proposal, and as he senses that his turn is coming to commit himself on the question, he reaches for a pad and begins writing. Then, when he is

finally asked to state his position on the matter, he looks up surprised and startled and says, "Beg pardon, I just got an idea that I want to get down before I forget it. . .better pass me by." This technique is most appropriate when the manager does not desire to make a public commitment that he may regret in the future.

Delay through Delayed Reaction. The delayed reaction shows how to let someone else make your decision for you. If a superior delays making an urgent decision, circumstances may force his subordinate to act. If a subordinate's decision turns out to be wrong, then the superior has someone to blame. If the right decision is made, the superior can take the credit.

Delay through Forgetting. A very useful method is simply forgetting the issue. This can be done on a singular basis or on a committee basis. The person in charge of obtaining the papers has to learn to develop the skill of losing them. This can be done by losing one's briefcase, losing a folder in the wrong (or even right) file cabinet, or just losing the papers themselves. Some requirements for being able to forget are: absent-mindedness, senility, and just a plain short memory.

In decision making, situations may arise where it is impossible for you to engage in a delayance syndrome. Anything and everything you try to use fails. It is also possible to meet situations where delays are not desirable, since they put off the inevitable. If you anticipate no changes in the situation that would make it easier or safer to make a decision in the future, then avoidance is the next logical step.

There is also another decided advantage to avoidance over delayance, which is extremely important to an individual who does not want to make decisions. If the delay tactic is chosen, there is a possibility for an infinite number of decisions in the future. When the delay runs out, as it eventually must, another decision must be made. This decision again involves whether to attempt to solve the problem, delay further, or to avoid. This can be continued indefinitely. On the other hand, if the avoidance tactic is chosen, there are a maximum of two decisions that must be made. For a true decision avoider, this is a decided advantage.

Passing the Buck

The most common and one of the easiest forms of avoiding decisions is to pass the buck to someone else. Although the basics of this technique are known to nearly all managers, there are variations which make the technique more effective, all of which are not well known.

Passing the buck can be accomplished through the wise use of either individuals or groups. Hull and Peter in their book, "The Peter Principle," state that there are three ways of passing the buck. There are "The downward, upward, and outward buckpasses." [9] These techniques require varying degrees of managerial skill: the upward requires the highest degree, the downward a medium degree and the outward the least. The latter two techniques are, therefore, within the reach of most managers.

In the *downward buckpass*, the papers are sent to a subordinate (preferably the same one that sent them to you) with the order not to bother you with such trifles. The subordinate is then bullied into deciding an issue that is probably above his level of responsibility. If, for some reason, you cannot send them to the same individual that sent them to you, then send them to another. The primary consideration is to get rid of them yourself. He will probably be totally confused as to what your message means and will render a decision, which has an excellent chance of being an incorrect one.

Another type of downward buckpass consists of forming a committee of your subordinates. There are two variations of this. One variation is to avoid the committee completely. The advantages of this will be discussed later. In the second variation, you appoint yourself as chairman. Then you are able to disclaim responsibility if the decision made by the committee is an incorrect one, since it is the committee's decision and not yours, but can claim responsibility if the decision is right. Both of the variations mentioned are known as the group downward buckpass.

Once the basic technique is chosen, then a possibility of two more decisions exist, whether to use the group or the individual technique and then whether to use either of the two variations. The disadvantage of the increased number of decision possibilities, however, are nor-

[9] *Hull, Raymond, and Peter, Dr. Laurence J., "The Peter Principle," (New York, N.Y., William Morrow & Co., Inc., 1969) p. 121.*

mally outweighed by the many advantages.

"The *upward buckpass* calls for ingenuity: The teeter-totter victim must examine the case until he finds some tiny point out of the ordinary which will justify sending it up to a higher level." [10] This technique would also be successful if he can claim that he does not have the authority to make the decision. Of course, by doing this he is creating a situation where a downward buckpass can be very efficiently used by his superior. This, in turn, can lead to a combination of a downward-upward buckpass. Figure 2 illustrates two possible combinations of the downward-upward buckpass. It should be noted that Version Two can be expanded, and is limited only by the span of control of the manager. Note also that in order for Version Two to work successfully, all subordinates must be skilled in avoidance techniques. Otherwise the decision will be made by someone by necessity. The important point for the manager to remember is *not* to be confused during the process to such an extent that he makes the decision himself.

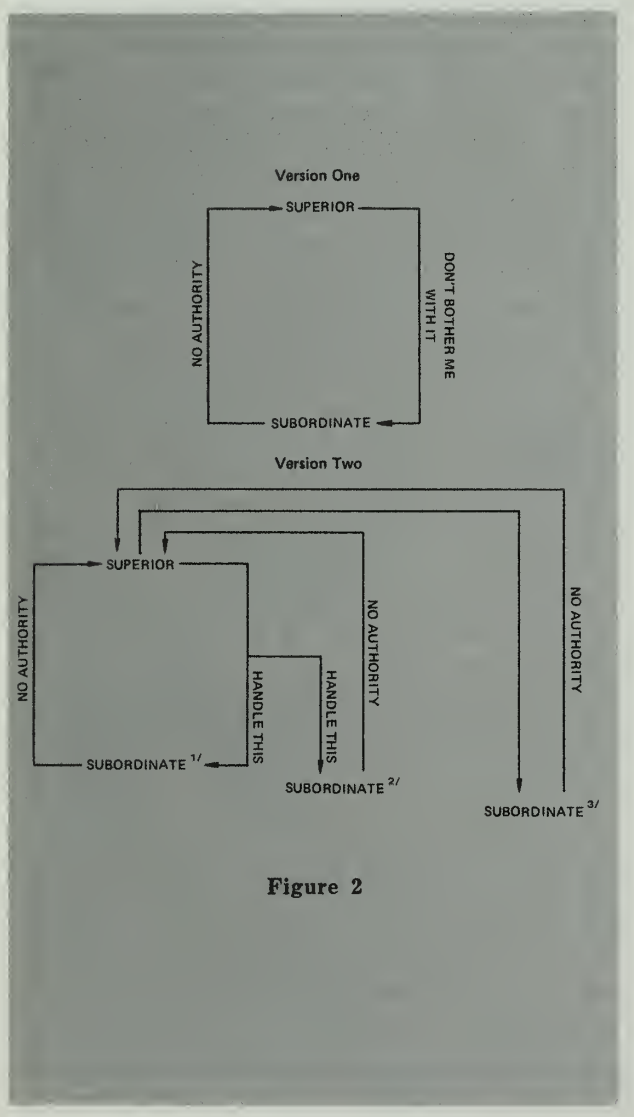


Figure 2

The *outward buckpass* merely involves assembling a committee of the victim's peers and following the decision of the majority. This is an unexciting and unimaginative form of buckpass. The basic problem is a mechanical one; unless you have a great deal of influence within the organization, it is difficult for you to assemble a committee of your peers. Most individuals are reluctant to serve on committees, and will strongly resist the situation unless the order comes from above them in the organization hierarchy. This implies a form of upward buckpass is necessary if you desire to get the committee assembled. Also, a committee of peers cannot be assembled by the chief executive of the organization since he has no peers, thus eliminating this possibility for him.

Committee Buckpassing

Since the committee stands out as a basic and fundamental form of buckpassing, a few remarks concerning committees in general would appear to be in order. By appointing a committee you greatly increase the chances that the decision will be avoided completely. The very fact that a committee has been appointed will almost ensure that a decision will not be reached. This is due to the fact that committees by their very nature are time consuming; usually indecisive due to reconciling of differences of members of the committee; prone to compromise, when a decision is reached, at the sacrifice of the best solution; and make it difficult to pinpoint responsibility in case of failure.[11] Even though the committee has these advantages built in, the wise manager will take the following precautions to further ensure that the decision will not be reached:

- Make the committee as large as possible.
- Make it difficult for members to convene.
- Appoint committee members who are in-

[10] *Ibid.*

[11] *Athos, Anthony G., and Coffey, Robert E., "Behavior in Organizations: A Multidimensional View," (Englewood Cliffs, N.J., Prentice Hall, Inc., 1968) p. 121.*

compatible.

• Nominate an incompetent chairman to head your committee (unless the technique of the group downward buckpass is adopted, in which case the superior appoints himself as chairman).

When setting up the committee, place all responsibility on it—abdicate your position as much as possible. Do not set any time limit or imply that a decision must be made immediately. Stress the point that you want *all* facts considered and every side of the issue discussed. If you must present facts to the committee, make them as vague as possible and throw in some irrelevant ones. This will confuse the members as to the real problem and, also cause the committee to spend a great deal of their time arguing over the issue itself. It's hard to reach a decision on an issue that you are not even sure about. Much of this strategy can be simplified if you can locate at least two individuals who are dependent upon you, place them on the committee, and give them specific instructions to confuse the issue.

Complete lack of communication, either written or oral, with the committee is one of the better forms of avoidance. If no one can contact you, you have to be passed by. When you cannot be contacted, the committee itself will have to decide what course of action should be taken on the issue. This will enable the committee to be bottlenecked in further deliberation and may cause the meetings to run indefinitely without reaching a decision.[12]

[12] *Randall, Clarence B., "The Lonely Art of Decision Making," Duns Review and Modern Industry, June 1959, p. 47.*

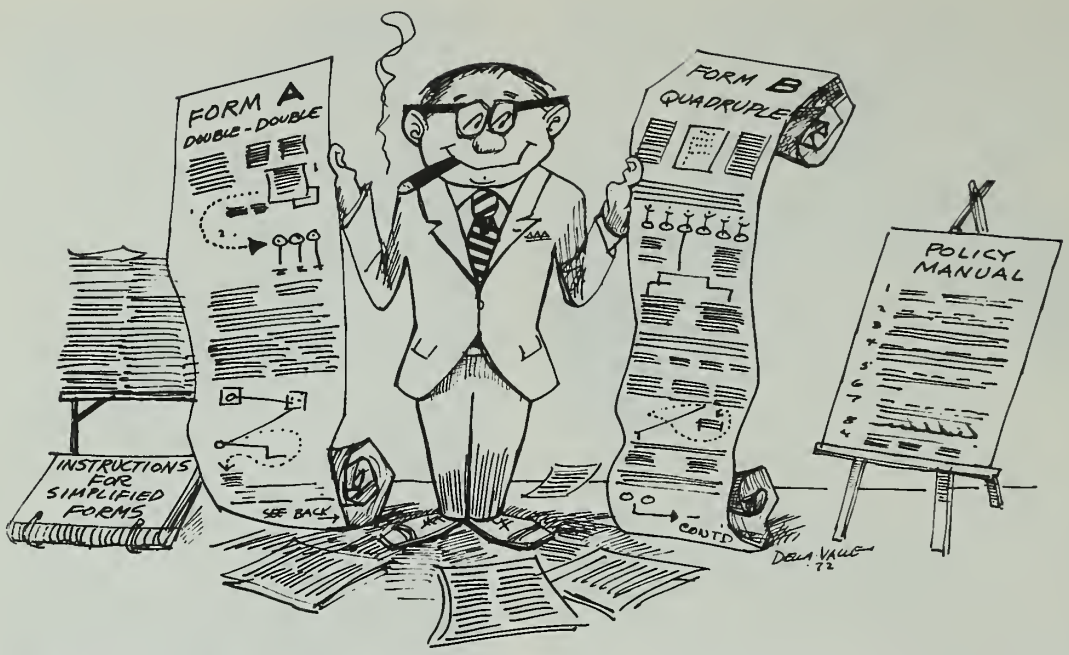
Avoid Decisions

Avoidance through Rule Making. Another tactic used to avoid making decisions is to make rules and policies. Whenever a situation arises where there is no rule to govern it, the decision maker makes a rule and adds it to his already large volume of rules. A good decision avoider will anticipate situations and make rules in advance of the problem. In this way his one decision may avoid any later on. For example, make an office policy that all requests and suggestions from employees be in written form. Design lengthy and confusing forms that must be filled out by the employee in many copies. Develop as many of these forms and procedures as possible. Insist that everything must be on a computer. This will give you time and probably discourage the employee. If the employee finds too many forms and too much red tape involved, he may find some other person to render the decision or, better yet, he may forget the request completely. He may even leave the organization if this happens often enough. If this happens, you have made progress and reached the ultimate in decision avoidance. If you can eliminate all persons that put you in a decision making position, you have greatly improved your situation.

When the supervisor cannot invoke a known formula that is theoretically or empirically verifiable, he will create his own. This is known in most organizations as a Policy Manual, Standard Practice Instructions, etc. This policy book can be turned to whenever the supervisor is confronted with a problem he does not know how to handle or what to do with. He will turn to the book and come up with the answer. This eliminates the necessity not only for decision making but interpretation.

Avoidance through Precedent. This is a common technique used by many managers. It eliminates the necessity for making decisions concerning new or innovative ideas. "We have always done it this way in the past and look where we are today" is a good way of handling a decision. Another excuse could be "We tried that once and it failed. Why waste time and try again?" You can also add, in extreme cases, "Do you know what happened to the man that suggested that?"

Avoidance through "No Problem Exists." The first step in the decision-making process is



to recognize that a problem exists. If you never get past this step, then the decision avoidance process is very simple. The manager denies the very existence of the problem by stating that the organization has gotten along fine without the benefits of the proposal. He should accuse the initiator of wanting to bring up useless and imaginary problems and warn him against it in the future. This creates a climate that is hard for the employee to ignore, and can put off future undesirable situations. This differs basically from avoidance by precedent by the presence of a threat.

Avoidance through Double Talk. The aim of this method is to confuse the proponent of a specific project by using top management jargon. This has the most effectiveness in dealings with a first line supervisor or an operative worker who has gained his knowledge from experience and is unfamiliar with the technical language of management science. Few people will admit they do not understand what they are being told, and will let the matter drop.

Avoidance through Scapegoating. This method is similar to but not the same as buck-passing. This involves coming up with an excuse for not doing something by putting the reason for not doing it on someone else. "We would be glad to do this, but if we did, we would have trouble with the Union" is a good example of a scapegoat. Another may be "the Marketing department wouldn't like it." This is usually followed by "try again later."

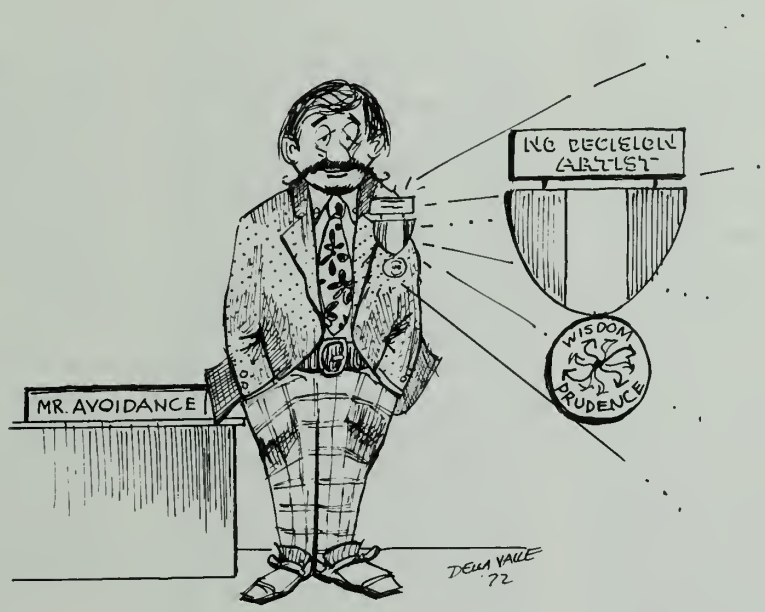
Avoidance through Tantrum. This is a crude and ancient method, but can still be effective with well chosen individuals. When the initiator offers a proposal, just throw a tantrum. Scream at the person about his trivial proposal when so many things are going wrong. This is used best by top executives. The manager can say "A thousand things around here need attention. Can't you spend your time on anything more useful than this?" This method is particularly useful when the manager is uncertain as to whether or not the proposal is important enough to be considered. After some thought, if he decides it is a good proposal, he can adopt it and claim it as his own.

Avoidance through Secrecy. The manager employs this method by warning the initiator of a proposal that the matter is already being considered by top management and that he should keep quiet and advise others to do the same. The method can be employed in the situation where he does not want to disturb the status quo of the organization or else wants to wait and introduce the proposal to higher management himself.

There are other, more crude methods such as pulling rank, creating a status barrier, and emphasizing your greater experience. Although crude, they can be effective in the proper set-

ting. It must be remembered that there is no set way of avoiding all decisions. A method of avoidance is a function of the nature of the problem, the degree of character of the manager, and the circumstances which prevail. Mathematically, it could be expressed by the formula A = f (P, C, C). You must choose the technique which will help you best avoid the decision in a particular situation. The primary factor in non-decision making is your desire to avoid the decisions.

Non-decision making is truly an art. It lies in the ability of a man to avoid declaring himself on the question before the house by creating a cloud of great wisdom and prudence into which he disappears. □



Shipyard Modernization Program

Navy Overhauls Shipyards To Stem Creeping Obsolescence

At the beginning of the last decade, the entire U.S. Naval shipyard complex was slowly sinking into obsolescence. Lacking essential modern equipment and becoming antiquated, these facilities were floundering and unable to provide adequate logistical support to the Fleet.

In 1963, both the Office of the Secretary of Defense and the Department of the Navy responded to the distress signals and conducted a high level, in-depth study of the naval shipyards complex. As a result, Navy has spent over $400 million in modernization programs in the past seven years to improve the industrial resources of its shipyards. Navy's initial five-year modernization program ended in 1968 and a new $1 billion, 10-year program (FY 1970–79) continues the effort.

These facilities, which comprise the world's largest job shop complex with a business volume of over $1 billion annually, provide depot-level support for the ships of the active Fleet. Some 50,000 pieces of industrial production equipment are located on 10 widely separated sites. Civilian specialists are employed at these sites in over 100 different trades and technical positions.

In examining its facilities, Navy took special consideration of the unique nature of naval shipyard production. Even under favorable production conditions, such as times of war or mobilization, naval shipyards can be characterized as a multiple-production industry, but never as a mass-production industry because of the highly skilled crafts required in shipbuilding and repair. According to the Bureau of the Census, the unit output of the shipbuilding and repair industry is extremely small in comparison with other industries, indicating the "customized" almost one-of-a-kind nature of the shipyard product.

Navy's modernization efforts will aid its shipyard facilities to support a composite Navy of the future, comprised of overaged ships, new ships equipped with modern electronics and weapon systems and to maintain our expanding nuclear Navy.

by Captain W. N. Ginn Jr., USN
Director,
Shipyard Modernization/Facilities Equipment
Naval Ship Systems Command

Shipyard Modernization Study

The aim of the Shipyard Modernization Office in the Naval Ship Systems Command (NAVSHIPS) is to make continuing broad and objective investigations of selected aspects of the shipbuilding and repair industry to develop methodology, facility acquisition programs and innovations for increasing efficiency, improving the capability and balancing the capacity of the

Naval shipyards.

Despite previous efforts, modernization of our Naval shipyards has been delayed far too long simply because each shipyard has been able to do a job by use of present methods, which in reality are often inefficient improvisations.

In 1961 the need for shipyard modernization was recognized by Congress. The shipyard modernization study undertaken by Navy, the first such comprehensive study ever made, was the result of a recommendation contained in the DOD base closure announcement of 1964. This, plus later guidance provided by the Office of the Secretary of Defense, particularly in the area of cost benefit analysis, made the prime objective of the study to explore the environment in which U.S. shipbuilding and repair operated in order to suggest ways in which the efficiency of the naval shipyards might be improved.

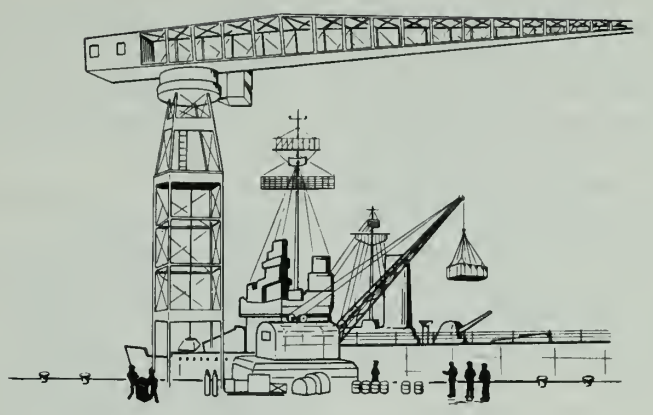
Program Goals

The subject was exhaustively analyzed, culminating in the Engineered Long Range Modernization Program for the U.S. Naval Shipyards approved by the Office of the Secretary of Defense in November 1968.

Naval shipyard modernization goals imbedded in this program are to:

- Reduce operating costs.
- Provide increased capabilities to serve the Fleet.
- Attain a balanced industrial capacity.

Specifically, these involve retarding the rising costs of fleet maintenance, reducing turnaround time during overhaul and repair so that ship time on-the-line can be increased and improving the quality of shipwork with a resultant increase in operational reliability and crew satisfaction. These goals also involve efficient support services to ships, which are becoming increasingly complex and sophisticated, and efficiently responding to the strategic and operational requirements imposed by higher authority.



The Assistant Secretary of Defense (Installations and Logistics) had directed that the Shipyard Modernization Program be presented in a form permitting review against projected shipyard workload. The study developed a program that established workload-related units and standards applicable to all naval shipyards. The program is a $1-billion, 10-year investment based upon a planning model that converts projected ship workload into facilities, equipment, and personnel skills required, and then compares requirements with assets.

Planning Areas

Shipyard Modernization Program tasks included development of a master industrial plan and a facilities planning system, both based on the disparity between requirements and assets, and both in consonance with the existing Navy Shore Installations and Facilities Planning and Programming System. Planning was developed in several separate but coordinated areas pertaining to the shipyard:

- Production facilities and equipment.
- Waterfront facilities and equipment.
- Utilities.
- Support facilities.

The program was structured on projects having a mandatory premise to meet statutory, workload and mission requirements, and a cost effective basis specifying modernization of equipment and facilities through additions and changes to enable the shipyard to perform its mission efficiently. The definition of requirements and principal parameters for the modernization program were drawn from:

- Workload schedules.
- Cost effectiveness techniques.
- NAVSHIPS schedules, policies, and procedures.
- Utilization of existing resources.
- State-of-the-art trends.

Program Development

Our older naval shipyards

have evolved their present layout and workflow by piecemeal additions sited wherever sufficient space could be found. Workflow necessary for efficient operations gradually became obstructed, and the naval shipyards were forced into the rigid mold of an existing layout. To reverse this condition, it was necessary to evaluate the existing assets in each naval shipyard in light of its own long-range workload requirements.

When we contemplate modernizing any industrial facility, we must first consider what it was created to do and then evaluate its present worth in terms of its future long-range utilization. During the entire program development we were constantly striving to determine how best to substitute capital investments for labor.

The first task was to develop a long-range workload forecast by extending the approved Five-Year Defense Plan for an additional five years. We next reviewed the naval shipyard capabilities in light of a Shipyard Policy Board report. Revised missions for each shipyard were developed to accommodate strategic requirements of the Chief of Naval Operations, Shipyard Policy Board's new construction criteria and general support for the fleet operational areas. A decision was made to specialize shipyards by combat systems rather than ship types (for example, anti-submarine warfare systems, anti-air systems, etc.).

Comparing Assets

Our next task was to distribute the predicted workload by shipyard in accordance with specialized capabilities. Armed with each shipyard's workload forecast, we began a detailed study of individual shipyards.

The first problem was to develop a least common denominator to express any workload mix of ship types in terms of facilities, equipment and manpower. Up to this point, the only common denominator was in terms of manpower.

We began to inventory existing assets and capabilities. Every building and major item of plant equipment was examined to determine its remaining utility. Each product or service was examined to determine the best way to provide it in the future.

The complete listing of minimum required facilities and equipment was compared with the assets. The deficiencies resulting from this comparison were then considered candidates for the modernization program.

The next step was to develop viable alternates for satisfying each deficiency and select the most cost-effective solution which then had to be translated into the proper program and budgeting documents for Military Construction Projects and Industrial Production Equipment procurements.

Long-Range Planning

To accomplish all of this required a new approach to modernizing an industrial complex. An evaluation of presently owed assets without first determining the optimum way to manufacture each product or perform each service would assure continued obsolescence. In a nutshell, the approach consisted of:

- Simulating an optimum modern shipyard to perform each shipyard mission.
- Developing standard units of measure applicable to all shipyards.
- Comparing each existing shipyard with the optimum shipyard.
- Scoping the resultant deficiencies.
- Identifying the industrial production equipment needs.
- Developing optimum workflow and layout.

To accomplish these complex

Modernization of the Philadelphia (Pa.) Naval Shipyard is scheduled for completion and occupancy in July 1973. Shown here is the before (left) and after of the Electronics-Weapons-Precision Facility.

and time-consuming tasks, we developed and are operating a fully mechanized Long Range Planning System (LRPS) for forecasting workload in terms of manpower, drydocking, berthing and utilities requirements, and a companion mechanized Shipyard Modernization System (SMS) for translating the workload developed by LRPS into space, equipment and manpower required to furnish all workload products or services.

These two systems highlight potential problem areas by predicting workload assignments and the resources necessary for accomplishment, and comparing these with actual resources. Using the LRPS workload output of volume, type of work (conversions, alterations, overhauls, new construction, etc.), and the distribution of workload between naval and private shipyards over a 10-year period, the SMS projects resources over this same period in terms of square feet of space, items of industrial production equipment along with their operating hours and manpower. These data are available at the shipyard level down through the shop group, shop, and work center levels. Summary reports comparing resource requirements for any two contrasting workload conditions, such as optimum vs average, new vs old, ideal vs real, or maximum vs minimum, are provided to assist in identifying major changes in resources necessary in the future to satisfy workload requirements.

Program Future

This is the first time that we have had the opportunity to try the "Total-Trend Concept" where all monies, regardless of the appropriation, have been related not only for each shipyard, but for our total shipyard complex. The approved Engineered Long Range Modernization Program for U.S. Naval Shipyards encompasses the period beginning in FY 1970 and terminating in FY 1979. The program was designed to utilize three different funding programs:

- MCON—Military Construction (brick and mortar, utilities improvements).
- OPN—Other Procurement, Navy (production equipment and collateral equipment for MCON projects having unit acquisition cost of $1,000 or more).
- O&MN—Operation and Maintenance, Navy (repairs, maintenance, minor construction, and collateral equipment costing less than $1,000 to support MCON projects).

One of the features of the approved program was that it was to be dynamic rather than static. We have provided a logic for making future facility and equipment decisions that is flexible enough to accommodate unforeseen requirements without program disruption. The program must be revised periodically to reflect significant changes in base loadings, strategic and operational requirements, etc. We are now engaged in the first such review and revision.

Summary

Naval shipyards constitute a major industrial complex that has evolved into an essential element of national defense. The role of the naval shipyards was covered in depth during hearings conducted by the Seapower Subcommittee of the House of Representatives Armed Services Committee in 1970. These hearings reemphasized that the shipyards are geographically well situated, are equipped, and have highly skilled and experienced employees enabling them to be flexible and responsive to almost any emergency. Their primary role continues to be the conversion, alteration and repair of our combat ships.

The basic mission of shore facilities is to serve the Fleet with a quick-response logistic support system. The shipyard complex plays a dominant role in this system. □

The ant finds kingdoms in a foot of ground.

—Stephen Vincent Benet

Army Outlines Advances in Safe Water Research

Scientists of Army Materiel Command (AMC) are working to produce safe drinking water, decontaminate polluted waters and develop chemical defenses against any future contamination of the waterways.

Army research and development in water purification is constantly producing new and improved methods and equipment for the protection of the health of the soldier and the civilian populace. Army scientists have made important contributions to the growing body of knowledge on how to produce safe drinking water and the treatment and sanitary disposal of waste waters. Chemical defense research and development is a continuing effort.

Army Materiel Command laboratories engaged in the water purification effort are the Mobility Equipment Research and Development Center at Fort Belvoir, Va.; Natick Laboratories at Natick, Mass.; and Edgewood Arsenal, Md. Programs of these modernly equipped laboratories are marked by close internal coordination and by a wide exchange of information with other government agencies and organizations in the private sector.

Water Purification for the Field Army

The Army's Mobility Equipment Research and Development Center (MERDC), an element of AMC's Mobility Equipment Command, is responsible for the development of methods and equipment required to produce drinking water and for the treatment and sanitary disposal of waste waters for the field Army.

As a result of the MERDC programs, a number of self-contained, transportable water purification units have been standardized. These units are capable of producing drinkable water on-site near the point of consumption from locally available water sources such as lakes, rivers and other streams containing excessive amounts of clay, salt, algae, micro-organisms, or unusual contaminants such as chemical, biological, or radiological agents.

A family of five water purification units is now available, varying in capacity and size, for producing drinkable water from 420 gallons per hour (GPH) to 3,000 GPH. The units are capable of producing drinking water from natural fresh water sources within 20 minutes after the start of operation. This contrasts with the required period of 4 to 6 hours for coagulation and filtration in a conventional municipal water treatment plant.

Mobile water purification systems have been put into emergency service during national disasters to provide drinking water for stricken civilian communities. The most recent application of their use in a civilian emergency came during the massive floods that hit the Northeastern United States in June 1972.

To treat seawater or brackish water, when these are the only water sources available, a 150

by Dr. R. B. Dillaway
Deputy for Laboratories
U.S. Army Materiel Command

GPH, trailer-mounted, vapor compression distillation unit was developed. This represents the first compact package of the heat pump principle, has demonstrated the feasibility of using special lightweight aluminum alloys in a corrosive, boiling seawater environment, and has demonstrated the effectiveness of specially developed citric acid scale prevention techniques.

For treating water contaminated with toxic chemical or biological agents, MERDC, in close coordination with Edgewood Arsenal, has developed a pretreatment package using the processes of super-hypochlorination and carbon absorption, followed by clearing in the basic unit.

Ion Unit

In March 1972 the Army type classified, as Standard A, a mobile ion exchange unit capable of removing soluble radioactive contaminants from water and demineralizing slightly brackish water. This unit produces drinkable water at the rate of 3,000 GPH, with the total quantity produced depending upon the amount of salt in the raw water.

Research and development personnel are currently investigating new and improved processes that will provide the field Army with improved capabilities for the production, storage and distribution of drinking water and for the treatment of the waste waters generated in field military operations for reuse or safe disposal.

A prototype multipurpose water purification unit is being fabricated in-house and is envisioned as a single system capable of producing drinking water from various sources that might be encountered by a field Army. In highly mobile, tactical field situations the system is designed to accomplish the same function that now requires water purification units, vapor compression distillation units, chemical-biological agent pretreatment equipment, and ion exchange units.

In the important area of waste water treatment MERDC is involved in a number of ongoing programs and investigative efforts. Under the Medical Unit Selfcontained Transportable (MUST) hospital program, the Office of the Army Surgeon General, with MERDC engineers as technical advisors, is developing a prototype water and waste management system for renovating to drinkable water quality the effluents (exclusive of human wastes) from a 400-bed field hospital.

For the Air Force project Bare Base, a prototype waste water renovation system is being developed that will be air transportable and will provide the capability of treating effluents from laundry, shower, kitchen and photographic facilities at a tactical airbase. The objective is to prepare the effluents for reuse or safe disposal in the environment.

Other current studies are aimed at advancing the Army's vital interests in pollution abatement.

Development is underway on a multipurpose, mobile, package sewage treatment plant and on systems for the on-shore or onboard treatment of wastes generated aboard Army water craft. Such processes for water and waste water treatment as ozonation and carbon adsorption are among the methods being closely examined at MERDC for possible application

Dr. Joseph Epstein, Chief of the Defense Research Branch of the chemical laboratory at Edgewood Arsenal, Md., explains the function of the color band utilized in an ion exchange column during water purification tests.

to Army problems in water decontamination. These compact and mobile treatment systems may also be useful for waste control in civilian applications such as at construction sites and recreational areas.

Small Quantity Water Purification

Individual small units or soldiers in the field who are not near a normal water supply point have their special problems in water purification.

The Lyster Bag, although little used today, is still found to be a convenient way of supplying drinkable water to small units of men camped in remote areas not easily supplied with engineer-processed water. The Lyster Bag water content is disinfected by using chlorine in the form of calcium hypochlorite. Normal chlorination level is two-parts per million (ppm).

Certain conditions in the field, however, make pickup water unsafe for drinking at normal chlorination levels. These include the presence of resistant intestinal viruses and other disease-producing organisms, water with a pH of eight or above, cold water and water containing large amounts of organic or contaminating material.

In the face of these conditions, higher-than-normal chlorination levels must be maintained to safeguard the health of the troops. To permit higher levels, Natick Laboratories has developed a chlorination testing kit that registers levels at 2, 5, or 10 parts per million.

For the individual soldier, emergency field conditions sometimes require him to find a source of drinking water other than normal supply points—a stream, a lake, or other natural source. Until 1952 the Halazone tablet was the Army's standard item of issue for disinfecting canteen quantities of water. But investigations by Natick Laboratories during and after World War II showed that Halazone was only a marginal disinfectant. It was determined that the tablet when used as directed did not quickly destroy the cysts of entamoeba histolytica, the causative agent for amoebic dysentery. Low temperatures or the presence of pollutional material were found to reduce the efficiency of Halazone to the point where it could not be regarded as an effective agent against the organism of amoebic dysentery.

In the aftermath of the Natick Laboratories studies, the Army replaced the Halazone tablet with a more effective iodine water purification tablet called Globaline. One Globaline tablet in a canteen of water releases eight parts per million of iodine.

Compared with Halazone, the iodine tablet has a number of advantages: Its germicidal action is less dependent on pH, temperature and time of contact; nitrogenous impurities in the water do not impair its effectiveness; and side reactions leading to consumption of the germicide are less marked for iodine than for chlorine-containing disinfectants.

Further, the iodine tablet has a much longer shelf life and, in a series of palatibility tests, was found to be more acceptable to users.

Chemical Contamination

Edgewood Arsenal is responsible for defense against military chemical agents and, as such, also responsible for research in the purification of water supplies.

After the results of Edgewood Arsenal studies are amassed, further work is conducted in cooperation with other agencies such as MERDC and Natick Laboratories. The arsenal laboratories provide the basic information necessary for:

- Assessing the hazard posed by the contamination of water by toxic agents.
- Developing means for estimating the degree of contamination.
- Devising procedures for decontamination or removal of the toxic agents from the water.

Military agents that can conceivably contaminate water supplies can be classified into four broad categories:

- Nerve agents.
- Vesicants.
- Arsenicals.
- Blood gases.

A series of tests led to the eventual development of test equipment with subsequent field tests demonstrating that water contaminated with any chemical agent could be purified to acceptable levels by the procedure of superchlorination followed by treatment of that solution with carbon to remove the excess chlorine. The Chemical-Biological Water Pretreatment Set, making use of the superchlorination-carbon treatment, is available in the Army logistics system.

Edgewood Arsenal's expertise in water decontamination and treatment places its laboratories in a strong position to perform research and solve problems in environmental pollution. Prob-

lems in the treatment of water supplies on the lower parts of some of our larger rivers and in the purification of battlefield water contaminated with chemical agents are quite similar. The basic steps of assessment, detection, analysis and removal are common to both.

Pollution Research

Fundamental studies of decontamination problems loom significant as environmental pollution problems become more acute. The studies of the kinetics and mechanisms of amine oxidations by chlorine and chlorine dioxide have provided a tremendous potential for predicting what can and cannot be done in treating wastes from the organic chemical industry.

Similarly, information has been collected on the behavior of organophosphorus esters such as agent GB in water solution and on their susceptibility to attack and destruction by various reagents.

Organophosphorus compounds are commonly used in pesticides; their confinement, decontamination, or removal is necessary to environmental pollution control. The new, very sensitive enzymatic techniques for detecting and estimating minute concentrations of organophosphorus agents and other anti-cholinesterase chemicals in air, water and soil also have use in environmental pollution control of pesticides.

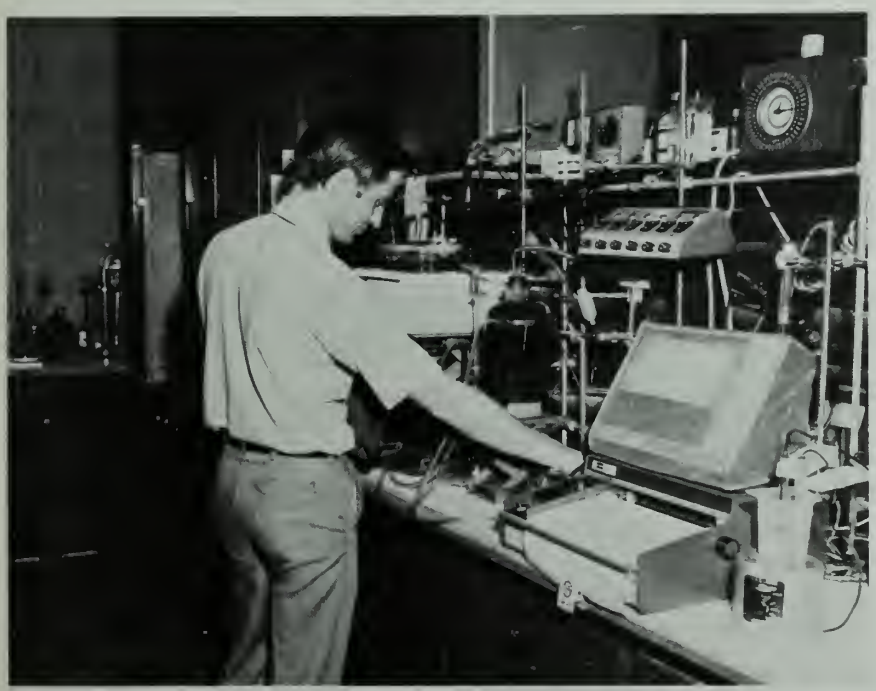
Another area of pollution research is the environmental impact of wastes from ammunition manufacturing. AMC's Army Munitions Command is taking action to reduce the pollution effects on land, air and water that result from the processes involved in producing ammunition commodities.

The Munitions Command has an ongoing research and development effort that includes studies of new processes and materials; treatment of effluents and wastes; toxicity characteristics and physiological activity of materials and wastes; metal parts fabrication and lubricant pollution.

One of the Munitions Command target areas is pollution abatement in the manufacture of TNT* which is still the most extensively used military explosive. In TNT production, a by-product known as "red water" (a mixture of TNT residues and sodium sulphate) was formerly discharged into waterways in a solution containing 5-percent solids. Two solutions to the "red water" problem have been developed.

In one, the water carrier is evaporated to produce a solution containing 35-percent solids, and the concentrated solution is used by the paper industry as a source of sodium and sulphur. The other solution is employed at TNT plants having no ready paper industry market. Here the "red water" is incinerated to consume the organic matter. Laboratory investigation continues to improve waste treatment in TNT manufacturing processes.

These water purification contributions, based on years of intensive research and development effort, are helping to ensure adequate water for the world's people in the years ahead. □



Explosive waste is converted on a laboratory scale into harmless non-toxic end product by Dr. Theodore Wendt, microbiologist, Natick Laboratories.

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* *See "Army Munitions Command Attacks In-House Pollution," by Maj. Gen. Erwin M. Graham Jr., USA,* Defense Management Journal, *April 1972 p. 60.*

Standard Time Data Program

Data Interchangeability Aids Development of Job Standards

Techniques for measuring work performance vary. Some are more accurate than others; some are more practical for measuring a type of work than others. Engineered work measurement standards are the most precise but also the most costly since they require considerable investigative effort to develop. Because of the cost factor, engineered standards are normally applied only to those areas where substantial savings can accrue. Savings are generated because accurate and practical work measurement ensures more precise planning and control of high-volume repetitive workloads and sounder judgment in adjusting work forces to meet changes in work requirements. These standards enable managers to do a better job of determining manpower requirements, planning workload, scheduling, budgeting and evaluating performance.

Standard Times Interchangeable

It has been determined that, since many jobs contain similar work elements, standard times could be interchanged and used without being remeasured. The more elements for which standard times are available, the quicker the job standard could be developed resulting in reduced overall cost. The predetermined time required to perform elements or increments of work is termed "standard time data." Analyzing a job permits application of the standard time required to perform each element of that job. Consolidation of these standard times results in a performance standard for the total job.

As a natural outgrowth of the use of work measurement, standard time data efforts were undertaken at command levels within the individual Military Departments. The resulting standard time elements were relatable but structured to each command's peculiar needs and desires. Thus, while it was possible to exchange data within a command, it was difficult and costly to exchange one command's data with another due to differences in code structures and application methods.

Policy direction in DOD Directive 5010.15, "Defense Integrated Management Engineering System (DIMES)," led to the establishment of a DOD-wide Defense Work Measurement Standard Time Data Program which recognized that considerable benefits would be realized if existing standard time data could be effectively exchanged between the data developer and other activities performing the same work throughout DOD.

by the Staff
Defense Productivity Measurement Office
OASD (I&L)

In order to assess the potential of a DOD-wide program, a study report was prepared by a Joint Service team under the direction of the Army Management Engineering Training Agency (AMETA). The AMETA report confirmed the feasibility of the Defense Work Measurement Standard Time Data Program through which a savings of millions of dollars could be realized annually.

Coding Structure

After completion of the AMETA study, a Joint Service ad hoc committee designed a coding structure to be used for both acquiring and applying standard time data. This coding structure was alphanumeric with mnemonic (memory jogging) qualities that identified the technique used in developing the data and the quality and developer of the data. Coding was necessary to permit introduction of existing standard time data into the DOD program, to provide a means of data storage and retrieval and to provide the user assurance of data quality and traceability to the developer.

An existing Department of Labor publication, "Dictionary of Occupational Titles," categorized all labor into the following basic occupational groupings:

- Professional, Technical and Managerial.
- Clerical and Sales.
- Service.
- Farming, Fishing and Forestry.
- Processing.
- Machine Trades.
- Bench Work.
- Structural.
- Miscellaneous (includes Materials Handling, Packaging and Transportation).

The Joint Service ad hoc committee decided to use the Department of Labor occupational codes in combination with the DOD standard time data codes to consolidate the data within the same occupational categories specified by the Department of Labor dictionary. This action took advantage of the effort already expended by the Department of Labor and tied the two programs together so future application of the Defense Work Measurement Standard Time Data Program could more easily be extended to other Government agencies as well as to the private sector.

The result of this coding effort is shown in an example from Volume II of the DOD Clerical and Sales Standard Time Data Manual (Figure 1).

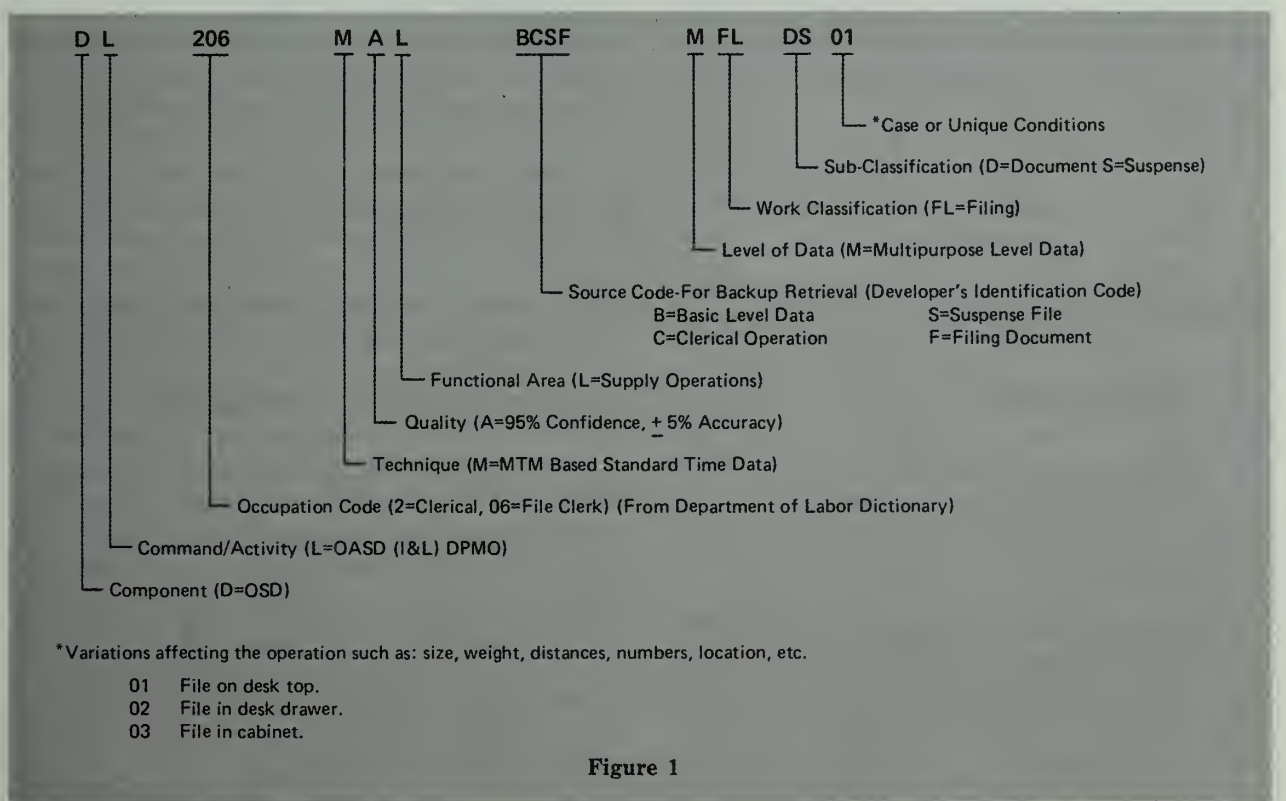


Figure 1

Upon completion of the coding structure, existing standard time data was obtained from each Military Service and the Defense Supply Agency. There were approximately 12,000 standard time data elements remaining after screening and initial sorting.

Clerical Category Tested

To determine the usability and feasibility of the Standard Time Data Program, the Joint Service ad hoc committee decided to develop and test one category of standard time data at selected DOD installations. Data for the clerical occupational category was selected for this test due to its wide applicability and the volume of data available. A second ad hoc group reviewed the clerical data elements, eliminated duplicates, assured the quality of data and structured the element description in a manner that was communicated uniformly to all intended users. A draft Clerical Data Manual was published and released to the DOD components for testing and evaluation in April 1972. The test results validated the cost effectiveness of the program and proved the feasibility and utility of the structure chosen for the Defense Work Measurement Standard Time Data Program.

The following examples of work measurement standards developed from the clerical data elements, during the test, are representative of the wide application made during the test period:

- Processing government bills of lading.
- Inventory control point processing.
- Payroll processing.
- Receipt document processing.
- Purchase order preparation.
- ADP keypunching.

The average time to develop an engineering standard under the Defense Work Measurement Standard Time Data Program was reduced by 41 percent. Experience by activities with existing standard time data systems indicates a further reduction in standards development time may be expected as the analysts gain proficiency in applying methods of the program.

During the evaluation and testing period, a 50 percent increase in clerical data elements resulted which further defined this occupational category. These data are now available for use. This is an indication of the growth that can be anticipated when standard time data elements are applied in all basic occupational groupings.

Single Standard Time Data Program Benefits

- Eliminate duplication of effort and reduce costs in the development of new standard data.
- Increase the productivity of methods and standards analysts and technicians.
- Provide users with more accurate and consistent information for resource planning and control, scheduling, and performance evaluation.
- Provide for furthering the objectives of other programs utilizing standard data, particularly the resource management system.

Increased Productivity

Application of standard time data provides many benefits which were demonstrated to be realistic during the test. Implementation of a standard time data program DOD-wide should increase the scope of these benefits. Interchangeability of data within DOD is presently hindered by different coding structures and application techniques. With a single program, interchangeability would be assured, the cost of developing and maintaining standards would be substantially reduced and engineered standards coverage would increase.

One of the criteria for selecting an item of standard time data for inclusion in the DOD-wide program is the basis of "best method of performing a task." Improved productivity should result.

The existence of DOD standard time data publications will permit easy dissemination of uniform data throughout DOD. These publications will be revised to include additional standard time data elements as developed.

The present time table calls for publication of a basic program guidance volume and the clerical volume by January 1973. Volumes on the other occupational categories will be time phased for completion as soon as possible thereafter. Volumes will be available from the Government Printing Office. □

Things Are Happening in the Information Security Program

The Deputy Assistant Secretary of Defense (Security Policy) is responsible for overseeing the development of security policies and the effective and uniform implementation of those policies throughout the Defense Department. During the past few years the entire Government, and particularly the Defense Department, has been faced with several new situations calling for management action regarding national, industrial and international security matters. The scope of these situations has involved participation of my office in management efforts from the White House and the Secretary of Defense to the various management levels within DOD.

The principal development which has affected management of the Information Security Program more than any other in recent years has been the complete revamping of the executive order governing the program. This was a result of an interagency study ordered by President Nixon in January 1971 to consider changes in security classification practices to make more information available to the public.

The outcome of the interagency study was Executive Order 11652 and the supplemental National Security Council (NSC) Directive of May 17, 1972, both of which became effective June 1, 1972. The order and the directive made several major changes in the treatment of classified information and material. The changes affect all Government activities. Some of them have an immediate visible effect such as the complete revamping of the downgrading and declassification system and the change in the classification standard from "could result" to "could reasonably be expected to cause" damage to "national security" which includes national defense and foreign relations.

Equally important, but less visible, are many changes which ultimately will affect all Government activities in a very real way. These changes will affect management of the Information Security Program, the ways and means of controlling the program and assessing its effectiveness and efficiency. They will involve not only top Government officials and offices, but also management at all DOD echelons and, ultimately, defense industry.

by Joseph J. Liebling
Deputy Assistant Secretary of Defense (Security Policy)

Presidential Concern

In a statement made when he signed Executive Order 11652, President Nixon expressed concern about the mounting volume of classified information and material and leaks of classified information. He said:

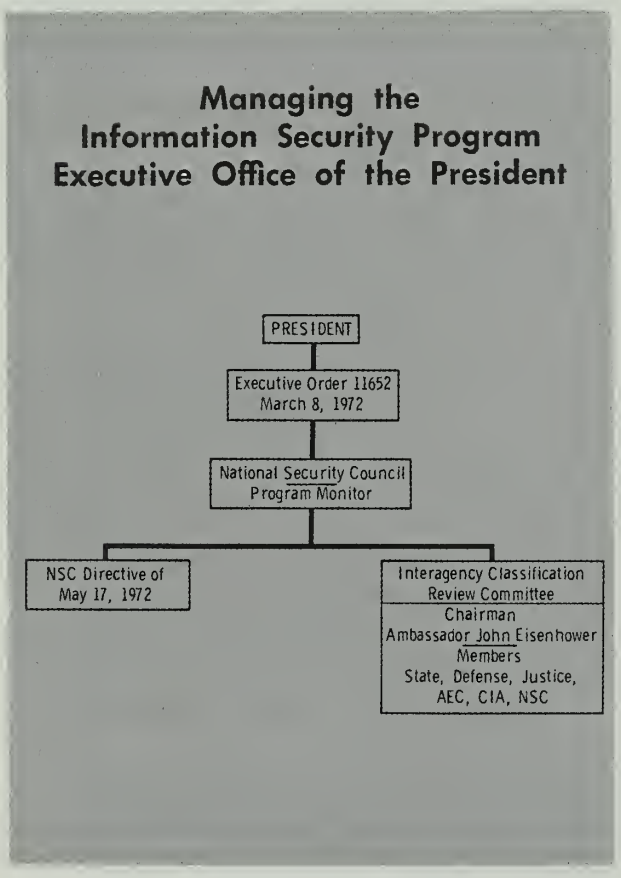
"Unfortunately, the system of classification which has evolved in the United States has failed to meet the standards of an open and democratic society, allowing too many papers to be classified for too long a time. . . . Once locked away in Government files, these papers have become hidden from public exposure for years, for decades—even for generations. . . . The many abuses of the security system can no longer be tolerated."

Covering another aspect of the matter, the President then said:

"Yet since the early days of the Republic, Americans have also recognized that the Federal Government is obligated to protect certain

information which might otherwise jeopardize the security of the country. That need has become particularly acute in recent years as the United States has assumed a powerful position in world affairs, and as world peace has come to depend in large part on how that position is safeguarded. We are also moving into an era of delicate negotiations in which it will be especially important that governments be able to communicate in confidence."

The President then recognized the necessity for striking a balance between the two principles of an informed public and confidentiality within the Government. In achieving this balance, the President indicated the goals of the Information Security Program will be to classify less, declassify sooner and better safeguard that information which truly warrants protection in the interests of national security. He included in Executive Order 11652 several mechanisms for better management of the program to assure attainment of these goals. Others have been included in the Department of Defense implementation of the executive order.



Initial Classification

As a first step toward better management control over initial classifications, the number of departments and agencies which can originally classify information at the Top Secret level has been reduced from 33 to 12. Twelve additional offices have been designated in the Executive Office of the President. An additional 13 departments and agencies have authority to classify originally at the Secret level. A few additional elements of the Government have been given Secret classification authority since the signing of Executive Order 11652.

To control original classifications even further, the number of officials who are authorized to classify originally has been drastically reduced in the Department of Defense at all levels: Top Secret authorities reduced from 835 to 592 (29 percent), Secret from 6,523 to 3,680 (44 percent) and Confidential from 23,-184 to 4,537 (80 percent), an overall reduction of 71 percent. The authority to classify is personal to the officials designated and to those officials specifically designated in writing to act in the absence of the designated officials. Classification authority cannot be delegated to anyone else.

These important features of the new executive order facilitate management of the program by clearly identifying those officials charged with the authority and concomitant responsibility for the original classification of official information or material.

The reduction in the number of Top Secret classification authorities has a particular significance because only those few designated authorities can make or approve exemptions from the General Declassification Schedule at any level of classification. In practical effect, this should result in many fewer documents remaining classified indefinitely.

Restrictions on original classification authority will certainly have a reducing effect on the quantity and level of classifications originally assigned and, in turn, significantly reduce classification actions stemming from those original determinations.

Identity of Authorizer

In a further effort to provide control over classifications assigned, the President pre-

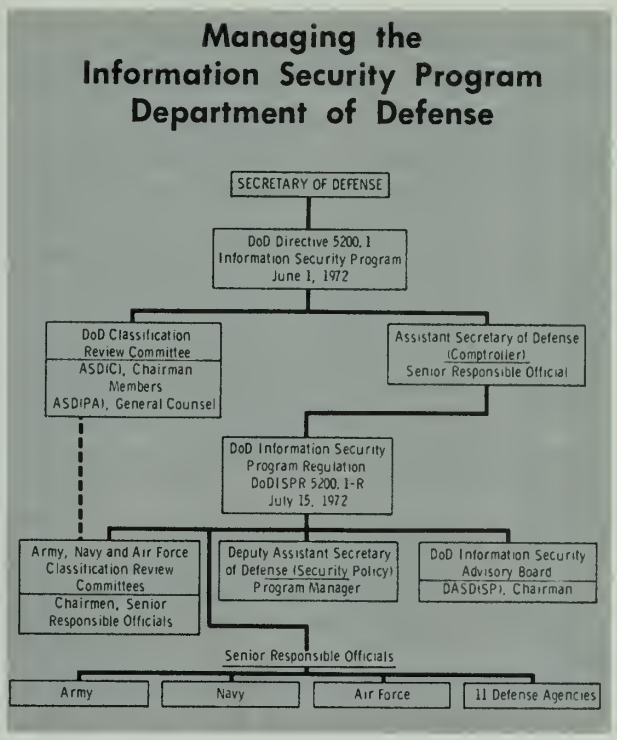
scribed that, unless some other method is provided for identifying the individual at the highest level that authorized classification in each case, material classified under Executive Order 11652 shall indicate on its face the identity of the highest classification authorizer. Since most classification actions are based on classification determinations taken from other documents or classification guidance, DOD policy requires that the original classification authority be identified, if known, on each document. If not known, the document source of the classification assigned will be identified, unless they are too numerous to mention.

In every case, the official who signs or finally approves the document or material is personally responsible for the accuracy and adequacy of its classifications. He is the accountable classifier and must maintain records which show the reasons for his classifications, if he is the original classifier, or the sources of the classifications he assigned.

The requirement for identifying the classifier and the sources of the classifications assigned is an important management tool. In the first instance, most signers or final approvers are in a supervisory capacity and the requirement forces them to consider critically the classifications assigned in the documents they are asked to approve. Further, higher echelons of command or supervision have a means of assessing the compliance of subordinate officials with established requirements and the quality of their classification determinations. The retained record also provides a basis for justifying the classifications assigned or an audit trail to locate original classifiers for review and downgrading and declassification action.

Monitoring System

These individual techniques provide some measure of management control but, as in any other program, the true measurement of the efficiency and effectiveness of the Information Security Program can be obtained only by ascertaining how well the fundamentals of the program are understood in field activities and the manner in which they are being applied in day-to-day operations. Recognizing this fact, the President established an elaborate system for monitoring the program beginning with assigning the responsibility for overall monitorship of the program to the National Security Council.



To assist the National Security Council in monitoring the program, the President established the Interagency Classification Review Committee (ICRC) and selected Ambassador John S. D. Eisenhower as its chairman. The general counsels of the Department of Defense and the Central Intelligence Agency, the legal adviser of Department of State, the Deputy Attorney General, and senior representatives of the Atomic Energy Commission and the National Security Council have been designated members of the ICRC. Representatives of other agencies are invited to the monthly meetings when matters of particular concern to them are discussed.

As an initial monitoring action, the regulations issued by all Government agencies to implement Executive Order 11652 and the NSC Directive are required to be approved by the ICRC prior to publication. The DOD Information Security Program Regulation, DOD 5200.1–R, was approved by the ICRC on July 6, 1972.

To provide the ICRC with data by which to measure compliance and to ensure effective implementation of Executive Order 11652 and the

NSC Directive, the executive order and directive specify the submission of quarterly reports by each Government agency. These reports cover the changes made in the designations of classification authorities; data on the number and kinds of abuses of the classification process, *e.g.*, overclassification, excessive exemptions, and unauthorized disclosures; the number, kinds and actions taken on requests for declassification and release of records more than 10 years old; and information on significant declassification actions and releases to the public. The ICRC is also exploring additional ways and means of obtaining data to assist its monitoring function.

DOD Management Structure

Within the Department of Defense, the Assistant Secretary of Defense (Comptroller) has been delegated authority and assigned responsibility for directing and administering an effective DOD Information Security Program in full and uniform compliance with the executive order and the NSC Directive. The Deputy Assistant Secretary of Defense (Security Policy) continues as the official who is responsible for effective and uniform implementation of the Information Security Program throughout the Department of Defense.

To advise and assist the Assistant Secretary of Defense (Comptroller), the DOD Information Security Advisory Board (DISAB) has been established and is chaired by the Deputy Assistant Secretary (Security Policy). The board, composed of representatives of the Military Departments and other principal DOD components, concerned with classified matters, has been charged with reviewing and evaluating the effectiveness of the program, developing and recommending new or revised uniform policies, standards, criteria and procedures necessary to meet changing conditions or to correct deficiencies in the program. The board is an active, progressive group which has already taken positive measures affecting all DOD activities, command structures and the defense industry.

To carry out its management function of review and evaluation of the program and to correct its deficiencies, the DISAB will need to be kept advised concerning operations, problem areas and possible solutions or recommendations from field activities. To meet this need, DISAB has been considering feasible ways and means of obtaining data by which to measure progress and effectiveness in implementation of the program.

Some thought is being given to the accumulation and reporting of statistical data on the volume of classified material being created, the levels of classification assigned, the downgrading and declassification instructions applied and the disposition of the material (retained, destroyed, downgraded, declassified, or retired). The Defense Department, with over one million civilian employees, over two million military personnel, and over a million industrial employees with DOD security clearances, is far and away the largest user and creator of the classified material. The cost in resources expended to obtain such data in the Department of Defense, because of its size and worldwide scope of operations, will make it necessary to consider very carefully the uses to which management could put these data, how it could be used to measure performance and compliance, and whether it would surface problem areas for solution.

Assessing Compliance

Although there are serious problems associated with obtaining statistical data on program operations, particularly concerning the origin and status of each classified document, there is, nevertheless, a need to provide all levels of management with data by which to measure compliance, *e.g.* on classification actions, downgrading and declassification determinations, and the use of the exemptions from the General Declassification Schedules. It is the quality of actions taken rather than quantity, however, which is indicative of effectiveness of compliance.

Information on the quality of actions taken cannot be obtained from statistical data on the numbers of actions taken. Evaluation of compliance requires review and appraisal of specific actions by knowledgeable people. This means personal action by command and supervisory personnel.

As one management tool, DISAB has developed a checklist to assist inspectors in reviewing the practices of field activities. This check-

list can also be used as a training tool and for self-evaluation. Information obtained by inspectors can be analyzed at command or supervisory echelons and by classification managers to determine the degree of understanding of established program fundamentals and the effectiveness of their application. Study and analysis of summary reports of many such inspections can provide DISAB with an excellent means of determining what and where improvements and remedial actions are necessary or desirable.

As a direct means of providing DISAB with information on program compliance, personnel from the Office of the Deputy Assistant Secretary of Defense (Security Policy) with representatives from the Military Departments and other DOD components will visit DOD field activities and industrial facilities. These visits will not be technical inspections but will be made to ascertain the level of understanding of program requirements, the procedures and practices used to apply those requirements, any specific problem areas with recommended solutions and, in general, the effectiveness of application of the program fundamentals. Information gained from such visits will supply a basis for assessing program strengths, weaknesses and needs, and assist in detecting training and personnel requirements and areas where changes, innovations, or refinements are indicated.

Professionals Needed

One of the real needs is a cadre of trained professionals in the classification, downgrading and declassification system. There is a fairly good pool of trained and experienced security safeguarding personnel but very few truly experienced classification specialists. This, of course, emphasizes the need for training and education. Formal classroom training is planned to develop classification specialists and training materials for on-the-job training and self-evaluation for personnel who become involved in classification, downgrading, declassification and the mechanics of document making. Specialized training material will be developed to assist system, program and project managers in the development of realistic security classification guides covering their activities and for the orientation of management officials in program requirements.

Better management of the Information Security Program will require the best possible use of available resources and, in some instances, additional resources. The NSC Directive indicates that adequate personnel and funding are to be provided by the responsible agencies to carry out the purposes of Executive Order 11652 and the directive.

As a last consideration, to convince management of the need for trained personnel and the value to be obtained from effective and efficient application of established classification, downgrading and declassification principles and practices, it is necessary to bring about savings or cost avoidances commensurate with the expenditure of the resources indicated. Realistic, representative costs associated, directly and indirectly, with the classification, downgrading, declassification and safeguarding of classified information need to be developed. Such data can be used to show how much has been saved or costs avoided by good classification practices and can show the value of having well trained, experienced specialists to assure that classifications are held to a minimum and declassifications effected promptly.

The continuing interest of management at all levels is necessary to assure an efficient, effective program. We will continue to work closely with the Military Services and the Defense Agencies, with defense industry and with the Council of Defense and Space Industrial Associations, the American Society for Industrial Security, the National Security Industrial Association, the National Classification Management Society and other industrial organizations in developing new ideas and techniques for continued improvement of the program.

There is no question that maximum efficient application of established principles and practices can save money and provide better utilization for available security protective resources. Equally, if not more, important is the fact that concerted action by management and all personnel to the efficient application of established principles and practices will facilitate the flow of information to the public, the scientific, technical and academic communities and our allies and, in the long run, increase public and Congressional confidence in the Information Security Program. □

a few words about...

Air Force Awards AMST Contracts

Air Force recently announced the award of contracts to Boeing Co. of Seattle, Wash., and McDonnell Douglas Corp. of Long Beach, Calif., to initiate design and development of an Advanced Medium Short Takeoff and Landing Transport (AMST).

In the AMST program, Air Force is seeking a low cost, medium-sized, short takeoff and landing (STOL) jet transport as a means to produce useful technology and hardware options to meet possible future military needs.

To achieve the best overall capability, contractors will work toward design, performance and cost goals rather than rigid specification requirements.

During the 90-day period of Phase I of the contract, the two contractors will complete and submit to the Air Force additional analyses of possible design performance trade-offs.

At the completion of Phase I, Air Force will review the contractor's analyses, make its own cost validation studies and determine whether to initiate the program's second phase.

In Phase II each contractor would design, build and test two prototype aircraft, using existing engines, to be evaluated against projected mission requirements. Phase II would cover approximately 44 months.

The AMST prototype procurement, one of a projected series in the Air Force prototype program, will be managed by the Prototype Program Office, Aeronautical Systems Division of AFSC.

A small management/technical team within this organization will ensure that the contractors have every opportunity to demonstrate ingenuity and inventiveness. Air Force standards and requirements will be used only as guides.

McDonnell Douglas design concept.

Boeing design concept.

New DACOWITS Leader Named

Mrs. Hugh W. Harris of Detroit, Mich., has been named chairman of the Defense Advisory Committee on Women in the Armed Services (DACOWITS), effective Jan. 1, 1973.

The purpose of this civilian-member group is to advise DOD on policies relating to women in the armed services.

Seeking public acceptance of career military service for women, the 50 members also promote community understanding of woman's role in the Services.

Each member of DACOWITS, which was founded in 1951 by General of the Army George C. Marshall then Secretary of Defense, is selected by DOD from America's prominent women.

Each member serves a three-year term as an individual, without compensation, and not as a representative of any group or organization.

Mrs. Harris is listed in "Who's Who in American Women," "Who's Who in the Midwest" and "Foremost Women in Communications."

Navy Develops Large Object Salvage System

As part of its overall R&D program, Navy is developing more reliable, safe and cost-effective salvage tools to recover commercial and military items as required.

One such tool is the Large Object Salvage System (LOSS), which recently lifted a 100-ton object from 100 feet of water in the Gulf of Mexico off Panama City, Fla.

LOSS operates by lowering a large pontoon over a sunken object and attaching arms to the object by firing explosive studs. Then through new bouyant gas-generating techniques, it raises the object to the surface. The latter two steps are accomplished by remote control from a surface support ship.

When LOSS's development is complete, it will have a self-positioning pontoon and through use of multiple pontoons will be able to lift aircraft and medium hull ships from depths of 1,000 feet.

The completed systems will eliminate the presently required use of divers to attach guidelines from the support ship to the pontoon and then to the sunken object.

The LOSS pontoon is an intricate system of electronic controls, high-pressure valves and gas-generating equipment. It is controlled from a command center aboard a surface support ship, thus minimizing the complex surface support presently required for such operations.

Using any one of three methods, LOSS generates a gas bubble inside the pontoon large enough to displace a weight of water equivalent to the combined weights of the pontoon and object.

Navy's Large Object Salvage System (LOSS) pontoon is 45 feet long, 15 feet in diameter and weighs 100 tons. Outline of six-foot man at left shows the size of pontoon.

For shallow depths of 300 to 400 feet the conventional compressed air technique, where compressed air is supplied to the pontoon from a surface support ship, is used.

At depths beyond surface support, a cryogenic (super cold) system utilizing liquid nitrogen in special containers (Dewar flasks) becomes the best buoyant agent.

However, when reaching depths where the pressure of water becomes too great to generate gaseous nitrogen, a liquid rocket fuel system using hydrazine to produce hydrogen is used.

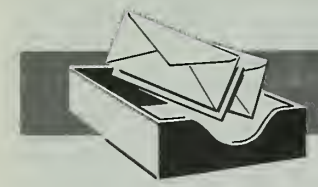
This project is part of an overall Ocean Engineering Research and Development program coordinated by the Oceanographer of the Navy, and managed by Naval Ship Systems Command as the principal development activity.

WINCON '73

"Emerging Business Opportunities Through New Technologies" will be the theme for the Institute of Electrical and Electronic Engineers's WINCON '73 to be held Feb. 13–15 at the International Hotel in Los Angeles, Calif.

Half-day sessions will feature noted specialists speaking on new technology applications and future requirements in such fields as transportation, environmental management, medical and health services, education, and law enforcement.

There will also be a concurrent symposium on classified subjects co-sponsored by Air Force Systems Command and the Aerospace Corp.



Letters to the Editor

Dear Sir:

I read with much interest the July, 1972, issue of the "Defense Management Journal." The various articles, though differing in detail, are all woven about the same general theme of how to bring about better management of weapons procurement. . . .

"Research and Development" is, as is well known, a tough problem and is one which has scored many successes as well as many misses. R&D depends on many people and, conversely, many people depend on R&D. There is obviously much merit in the postulation that successful R&D is to a great extent a team effort. It is seldom postulated that a team, after a certain stage is reached, devotes possibly more R&D on team preservation than it does on other interests. Forward action slows, exceptional producers move on, and the good solid members go into a defensive posture.

"Weapons Systems"—Weapons system development requires program managers, project managers, scientists, industry representatives, engineers ad infinitum. In such a congregation, representatives of almost every type of person can be found: brilliant and steady, brilliant and erratic, not so brilliant, and both smart and non-smart "slippery" types, etc. To me, it seems that for some reason weapons systems organizations get more than their fair share of the slippery types as project managers. They rend the air with cries for "freedom of action to get the job done"; and yet when the chips are down, they bring to mind a globule of mercury on a teeter-totter. . . .

. . . A lot of the troubles experienced in system development seem to be people problems. Assuming this to be a valid assumption, what can be done about project manager people problems? There is no good answer; but the following could be considered as a partial palliative.

"Smart" people are required in the discussed positions. Smart people have an active sense of self-preservation which may also at times make them expert mistake "cover uppers." What I suggest is that the personality profile of a weapons system project manager group be judiciously leveled with a sprinkling of those who are not so fast on their feet. Fumbles will certainly continue, but it may become easier to detect fumbles at an earlier stage before they become disasters. . . .

Hind-sight specialists—H. S. S.'s can be very annoying when the deed is done and nothing much can be changed. However, such specialists inserted at appropriate stages of a program can be very useful. In fact, even though the program increment is successful, if this success can be kept from the knowledge of the H. S. S., he may be able to spot a number of errors that obviously kept it from working. This sometimes leads to distinct improvements. Needless to say, the working teams should be insulated from the activities of an H. S. S. . . .

Disciples of Futility—A practicing D. O. F. may with caution be phased in and out of a program at appropriate times as a straw man whose defeat will boost morale. However, an overly eloquent or gifted D. O. F. should not be considered for program work.

Obviously, I do not have any answers to what appears to be a host of problems endemic in weapons procurement. I do suggest, however, that a prospective program manager try to jot down the personal traits as well as the technical abilities of the team. . . . Certain types should be phased in and out at various stages of the program. . . . As there are about two hundred and five million of us, paucity of traits should not be a major problem.

Sincerely,

E. B. Woodward
North Charleston, S.C.

Dear Mr. Shillito:

. . . I appreciated having the opportunity of presenting the [Productivity] article and hope that along with the other articles which the journal contains [October 1972 issue] it will be of some assistance for those reading the journal in reaching a better understanding of the importance of productivity improvement.

Sincerely,

M. P. Venema
Chairman of the Board
National Association of Manufacturers

Dear Sir:

. . . a copy of remarks made by Mr. Roger T. Kelley, Assistant Secretary of Defense (Manpower and Reserve Affairs) in the October 1972 issue . . . is being sent to various business and corporations in the Minneapolis/St. Paul, Minnesota area.

SSG Steven J. Rogge
USAADGRU (ARNGUS) MN
St. Paul, Minn.

☆ U. S. GOVERNMENT PRINTING OFFICE : 1972 515-637/2

defense management JOURNAL

Vol. 9, No. 1 January 1973

The Defense Management Journal is published quarterly by the Directorate for Management Evaluation and Materiel Control, Office of the Assistant Secretary of Defense (Installations and Logistics), for distribution within the Department of Defense.

The Defense Management Journal seeks to stimulate management improvement and encourage excellence in the administration of governmental resources.

Inquiries may be directed to: Editor, Defense Management Journal, OASD(I&L), Cameron Station, Alexandria, Va. 22314. Telephone: (202) 274–7558, Autovon: 284–7558.

The Journal is available on subscription from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, $2.50 a year domestic, 75 cents additional for foreign mailing. Single copy 75 cents.

Secretary of Defense Designate

"I eagerly anticipate wrestling with the many challenges that await me at the Department of Defense."—*Elliot L. Richardson*